

Running head: WEB-BASED TRAINING FOR PARENTS OF CHILDREN WITH ASD

Web-based training in behavioral interventions: Examining knowledge and empowerment in
parents of children with autism spectrum disorder

A dissertation submitted to the Graduate School in partial fulfillment of the requirement for the
degree of doctor of philosophy by

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Abstract

The purpose of this study was to determine the effects of a web-based training program in behavioral interventions to parents of children with autism spectrum disorder (ASD). Changes in parental knowledge of behavioral interventions, parental empowerment (as measured by the Family Empowerment Scale; FES, 1992), and skill in identifying and requesting evidence-based treatments for educational planning were assessed following participation in the web-based training program. The current study reports the findings of a sample of 14 parents of children, ages 6-12, with ASD. Parents were randomly assigned to treatment and waitlist control conditions, during which the treatment group completed five hours of a web-based training program (Autism Training Solutions; ATS). Repeated measures ANOVAS were used to analyze between and within groups effects for parental knowledge, empowerment, and skill in identifying and requesting evidence-based treatments in their child's IEP. Results of the repeated measures ANOVAs indicated significant between and within groups effects in parental knowledge of behavior interventions. Changes in parental empowerment were not observed. Pre- and post-training comparisons indicated a significant interaction for treatment in parental ability to request evidence-based treatments in their child's IEP, while a near significant interaction for treatment was observed in parental ability to identify evidence-based treatments over those with little empirical support. Descriptive analyses of satisfaction with the training program indicated that parents were, overall, satisfied with the ATS training experience. Implications and limitations of the current study, including a limited sample, are discussed, as well as suggestions for future research. The positive changes experienced by parents who participated in the training suggest a need to replicate this study with a larger sample.

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CHAPTER I

Introduction

This section describes the rationale and purpose of the current study, and significance of the study to the fields of psychology and applied behavior analysis (ABA) based upon a brief review of relevant literature.

Introduction

The concept of autism was first introduced in the 1940s by Leo Kanner, who characterized autism as an impairment in behavioral features, including aloofness and indifference, and intense resistance to changes in one's routines (Shapiro & Accardo, 2008). Changes in diagnostic criteria have occurred over time (e.g., Kanner, Rutter, DSM-IV, ICD-10), often resulting in or responding to an increase in prevalence. Currently, the Diagnostic and Statistical Manual of Mental Disorders (DSM-V; American Psychiatric Association [APA], 2013) classifies Autism Spectrum Disorder (ASD) as a neurodevelopmental disorder characterized by deficits in social communication, and the presence of restricted, repetitive patterns of behaviors and interests. These symptoms are present in the early developmental period and result in a significant impairment in social, occupational, or other areas of functioning. Until recently, autism was characterized a pervasive developmental disorder (PDD; DSM-IV; APA, 2000), with several other disorders encompassed within this category (e.g., Asperger's Disorder and Pervasive Developmental Disorder – Not Otherwise Specified). The most recent edition of the DSM, however, defined the aforementioned symptoms as falling within the diagnostic category of Autism Spectrum Disorder, which can be differentiated by clinicians through separate levels of symptom severity (APA, 2013).

The lives of family members of children diagnosed with autism are often profoundly influenced by the diagnosis, and parents are often forced to adapt to the changing social

expectations for their children. Parents often report experiencing feelings of shock, guilt, anger, and relief following the diagnosis of their child. (Hutton & Caron, 2005; Fleischman, 2004). Families of children with disabilities are likely to experience elevated levels of stress as they seek to understand their family member's unique difficulties and struggle to gain access to beneficial treatments (Dorenberg & Baker, 1993; Minnes, 1988). Children with developmental disabilities experience positive outcomes when family members are given appropriate supports for raising children with special needs (Bouma & Schweitzer, 1990; Dunn, Burbine, Bowers & Tanteleff-Dunn, 2001; Holroyd & McArthur, 1976; Montes & Halterman, 2007). Thus, support for positive family functioning is an essential component of care for children with autism.

Statement of Problem

The Centers for Disease Control and Prevention (2014) recently reported that approximately one in every 68 children has an autism spectrum disorder (ASD). As the number of children diagnosed with ASD has increased, a parallel increase in autism research has occurred and greater treatment options are now available from which families and service providers must choose (National Autism Center, 2009). There are a number of resources that can inform decision-makers about which treatments have empirical support and those that do not (e.g., DeMyer, Hingtgen & Jackson, 1981; Herbert, Sharp & Guadiano, 2002; Hingtgen & Bryson (1972); Kahng, Iwata, & Lewin, 2002; Matson, Benavidiz, Comptom, Paclawskyj, & Baglio, 1996; National Autism Center, 2009; National Professional Development Center on Autism Spectrum Disorders, 2011; National Research Council, 2001; New York State Department, Early Intervention Division, 1999). However, many parents are not familiar with these documents, cannot weigh the advantages or disadvantages of treatment based on science versus personal endorsements, or are not in a position to access these interventions for their child

on the spectrum (Association for Science in Autism Treatment, 2011). Local qualified practitioners who can provide evidence-based treatments may be nonexistent or unavailable due to the large demand (Johnson & Hastings, 2002).

Due to the large need for delivering evidence-based treatments to individuals on the spectrum, one possible method of increasing the child's access to treatment may be by training individuals who have frequent contact with the child (e.g., parents and caregivers) to implement these interventions in the natural environment. Researchers have successfully trained parents to implement intervention techniques to improve their children's level of functioning (Koegel, Bimbela, and Schreibman, 1996). However, there is a lack of research regarding parents' accessibility to and satisfaction with training. Additional research is needed to determine the direct (e.g., parental knowledge) and indirect (e.g., parental empowerment) impact parent training may have. Further, methods for increasing parental access to time efficient and cost-effective training must occur.

Given the increased level of stress parents may experience in raising a child with disabilities (Fleischman, 2004; Hutton & Caron, 2005), it is reasonable to suspect that parents of children with autism may benefit from more accessible and parent-friendly methods of training that can improve their ability to identify and request evidence-based treatments. The overarching purpose of the current study was to explore web-based training as a method of increasing parent knowledge of behavioral interventions for children with autism because this is an easily accessible approach to training that enjoys research support for a range of different learners. This study also examined whether parents involved in web-based training are more empowered in advocating for the provision of evidence-based treatment for their children within the school setting.

The increased prevalence of autism also has influenced educational programming (McIntosh, Chang, & Pierson, 2010) as school systems are required to meet the educational needs of children with autism who are enrolled in public schools. School systems are obligated to follow federal and state guidelines for provision of services to students with autism whose academic performance is negatively impacted as a result of their condition. When a child is found eligible for special education services, parents have rights and responsibilities based on legal mandates outlined in the Individuals with Disabilities Education Act (IDEA, 2004). Historically, parental involvement in special education has been minimal, though shifts in federal legislation through 1997 and 2004 amendments to the Individuals with Disabilities Act resulted in a greater emphasis on collaboration between parents and school personnel. The changes to IDEA required that schools actively work to involve parents of children with disabilities in the programming of special education services, as well as promote easy access to school records and active participation in the development, implementation, and monitoring of special education services.

Despite legal mandates regarding parental involvement in special education planning, as well as research findings suggesting the benefits of parental involvement (Koegel, Koegel, & Schreibman, 1991), there continues to be a lack of parental involvement in special education planning (Spann, Kohler, Doenksen, 2003; Stoner et al., 2005). The process of entering into the special education maze may be an overwhelming task for parents who seek to best meet the needs of their children. Poor communication and collaboration between the family and school personnel may result in parental feelings of confusion during IEP meetings, as well as dissatisfaction with services (Stoner et al., 2005). Parents may report the process of determining eligibility and placement to be prolonged, stressful, and bureaucratic even when their children

are provided special education placement and services of their choosing (Tissot, 2011). Because existing research has suggested positive child outcomes for increased parental involvement (Koegel et al. 1991), it is important to emphasize the role of the parent in educational planning.

A lack of knowledge regarding their child's condition or the evidence-based treatments that can improve their child's educational experiences may serve as a significant barrier to parental involvement (Stoner, et al., 2005; Vaughn, Bos, Harrell, & Lasky, 1988). Families who have not learned enough credible information about their child's diagnosis or treatments may have increased difficulty in advocating for their child's needs. Parents who are not familiar with appropriate behavioral or educational interventions may have difficulty communicating about all of their child's needs and requesting appropriate treatment. Alternatively, family members who are trained in effective intervention terminology and techniques may be more involved and successful in advocating for appropriate services (Hamad, Serna, Morrison, & Fleming, 2010).

As noted previously, parent training can be an effective method of treatment delivery, suggesting it is possible for parents of children with autism to learn behavioral intervention techniques and implement these interventions with high treatment fidelity within the natural home environment (Koegel, Bimbela, & Schreibman, 1996). Research in the area of applied behavior analysis (ABA), the most well supported treatment for ASD, has demonstrated that increases in the children's skill acquisition and decreases in challenging behaviors can occur when parents are provided with training in behavior modification that includes clear and specific instruction, the use of visual and auditory models, examples and non-examples, and the opportunity for practice and feedback (Gillett & LeBlanc, 2007; Herbert & Baer, 1972; Ingeroll & Dvortcsak, 2006; Koegel, Glahn, & Nieminen, 1978; Laski, Charlop, & Schreibman, 1988; Reagon & Higbee, 2009; Sanders & Glynn, 1981; Vismara, Colombi, & Rogers, 2009). Given

the body of literature demonstrating the effectiveness of parent training as a method of treatment delivery of children with autism, it may be especially important for service providers to consider the role of the parent to be imperative in the treatment planning and implementation process.

Despite the large amount of research consistently suggesting parent training be included in the treatment of children with autism (Brookman-Frazee & Koegel, 2004; Jang, Dixon, Tarbox Granpeesheh, Kornack, & de Nocker, 2012), parents may be restricted in their access to training due to issues such as geographical availability, financial issues, time, or additional family factors (Jang et al., 2012). One alternative to traditional parent training that may occur through community programs, school systems, hospitals, or university programs, is online, distance learning programs. Distance learning refers specifically to the use of computer and communication technologies to provide instruction (Moore & Kearsley, 2005). Distance learning has become an increasingly popular method of instruction across a wide range of training institutions (e.g., universities, employers) (Boettcher, 2004). Although some research has questioned the effectiveness of media-delivered instruction as a method of increasing knowledge acquisition in adult learners (Clark 1983; Clark, 1994), there is substantive support for web-based learning as a method of instruction that results in performance comparable or superior to that of traditional, face-to-face instruction (Bernard et al., 2004; Christianson, Tiene, & Luft, 2002; Howard, Schenk, & Discenza, 2003; Sitzmann, Kraiger, Stewart & Wisher, 2006; Tallet-Runnels et al., 2006). Web-based instruction as a method of increasing parental knowledge of evidence-based treatments for ASD is an emerging area of research, with a limited number of existing studies exploring the effects of web-based instruction on knowledge acquisition for parents of children with ASD. Should web-based learning become an option for parents of

children with ASD, this may result in more cost effective and time efficient delivery of training in the area of behavioral interventions.

Purpose of the Study

Previous research has demonstrated success in increasing parent knowledge of behavioral interventions (Herbert & Baer, 1972; Ingersoll & Dvortcsak, 2006; Koegel, Glahn, & Nierminen, 1978; Laski, Charlop, & Schreibman, 1988; Sanders & Glynn, 1981). The purpose of this study was to explore web-based training as a method of increasing parent knowledge of behavioral interventions for children with autism. The current study also aimed to determine if increased knowledge of behavioral interventions results in increased parental empowerment in educational planning. Additionally, because there is a current lack of research regarding the most effective and accessible methods of providing parent training, the study also assessed parents' level of satisfaction with web-based training in behavioral interventions. In the present study, participants assigned to the treatment condition were provided with eight hours of web-based behavioral intervention training through Autism Training Solutions; assessments measuring knowledge acquisition were administered throughout the training. The Family Empowerment Scale (FES; Koren, DeChillo, & Friesen, 1992) was used to measure empowerment in the school setting before and after training. Increases in knowledge acquisition and parental empowerment of those involved in the treatment condition were compared to a wait-list control group, who did not have exposure to the web-based training program until the conclusion of the study. Level of satisfaction with web-based training was also assessed qualitatively in parents who were assigned to the treatment condition. By exploring knowledge acquisition and increased empowerment in parents of children with autism, this study explored a method of providing parents with knowledge of evidence-based treatments, and therefore increasing empowerment in

their children's educational planning, as compared to those who do not have access to web-based training in behavioral interventions. This study examined four research questions:

1. Do parents of children with ASD who participate in web-based training in the area of behavioral interventions demonstrate increased knowledge of behavioral interventions compared to parents who do not receive behavioral intervention training?
2. Do parents of children with autism who participate in web-based training in the area of behavioral interventions report increased empowerment in educational planning compared to parents who do not receive behavioral intervention training?
3. Do parents of children with autism who participate in web-based training in behavioral interventions demonstrate increases in their ability to identify and request evidence-based treatments for their child within an educational setting as compared to parents who do not receive behavioral intervention training?
4. Do parents of children with autism who participate in web-based training report satisfaction with their training experience?

Significance of the Study

By examining the effects of web-based training in the area of behavioral interventions, this study contributes to the existing literature regarding knowledge acquisition and parental empowerment through web-based training in parents of children with autism. The present study further contributes to the literature regarding the effectiveness of web-based training, especially with parents of children with autism. Increased empowerment as a result of knowledge acquisition in the area of behavioral terminology and techniques was assessed. Finally, the current study explored whether parents who have access to web-based training in behavioral

interventions are empowered to advocate for evidence-based educational practices in their child's IEP.

Chapter II

Review of Literature

This chapter contains a review of literature relevant to the current study. Research on parents of children with autism spectrum disorders (ASD) as the population of interest is reviewed. Specifically, the historical role of parents of children with ASD in advocating for their child's treatment and educational planning is discussed. A review of research regarding evidence-based treatments for individuals with ASD is also provided. Options for increasing parental knowledge of behavioral intervention techniques are discussed through a review of outcomes of existing parent training programs, with specific regard to the use of web-based instruction in the area of applied behavior analysis (ABA).

Population of Interest

Autism is characterized by qualitative impairments in social interactions and communication, as well as the presence of stereotyped behaviors, highly focused specialized interests, and/or adherence to a non-functional routine. Diagnostic criteria historically classified autism as a Pervasive Developmental Disorder (PDD), a category that encompassed Autistic Disorder, Asperger's Disorder, Rett's Disorder, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS; American Psychiatric Association [APA], 2000). Increased subtyping of the aforementioned PDDs occurred over time, though the term ASD has occurred commonly among medical and mental health professionals, school personnel, and family and community members. The term "ASD" was first coined by Allen (1988) and is used to refer to a broader clinical phenotype of individuals displaying symptoms consistent with the diagnostic criteria of any of the pervasive developmental disorder included within the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition—Text

Revision (DSM-IV-TR). With the conceptualization of autism and other pervasive developmental disorders as a “spectrum disorder,” autism has come to be understood as a condition to which social, communication, and behavioral symptoms present on a continuum (Filipek et al., 1999) and that the features may be highly variable in this heterogeneous population.

Recently, the American Psychiatric Association (2013) published a revised edition of the DSM (i.e., DSM-V), which eliminated the category of pervasive developmental disorders, and introduced ASD as a category listed within the area of neurodevelopmental disorders (APA, 2013). The conceptualization of the autism spectrum promotes the understanding of autism as a range of symptoms, rather than the presence or absence, and is likely to become increasingly well-recognized and utilized among medical and mental-health professionals.

The DSM-V includes the broad category of autism spectrum disorder, encompassing the previous characteristics of conditions including autistic disorder, Asperger’s Disorder, PDD-NOS, and the addition of “social communication disorder” (Huerta, Bishop, Duncan, Hus, & Lord, 2014; Swedo, 2009). Further, the severity of symptoms is also identified in the DSM-V (Frazier et al., 2012). The core deficits that characterize ASD, according to the DSM-V, include (a) impairments in social communication and social interaction across multiple contexts (i.e., deficits in social-emotional reciprocity and nonverbal communication; difficulty developing, maintaining, and understanding relationships); (b) the presence of restrictive/repetitive patterns of behavior or interests (i.e., stereotyped or repetitive motor movements; insistence on sameness and an inflexible adherence to nonfunctional routines; restricted range of interests; and abnormal response to sensory input); (c) the presence of the aforementioned symptoms early in the developmental period; (d) clinically significant impairment in social, occupational, or other

important area of functioning; and (e) disturbances no better explained by intellectual disability or global developmental ability (APA, 2013). Within the spectrum of autism there is marked variability in the severity of symptoms across patients, with some presenting with profound intellectual disabilities, limited verbal abilities, and impaired adaptive function, while others display superior-range intellectual abilities (Filipek et al., 1999). Further, the same individual may show significantly few symptoms under certain conditions and more under others (Kanne, Abbacchi, & Constantino, 2009).

Regardless of the severity of the symptoms, one of the most salient characteristics of ASD is the organic, and developmental nature of the condition. That is, although evidence-based interventions have been identified in order to decrease the severity of the symptoms and improve the overall functioning of individuals affected by the condition, ASD is a pervasive condition that will persist across the lifespan for most individuals receiving this diagnosis (Boelte & Poustka, 2000).

ASD and Family Functioning

Not only are the lives of individuals diagnosed with ASD affected by this condition, but the level of family functioning and quality of life of the family members of individuals with ASD are also affected (Solomon & Chung, 2012). Even prior to receiving a diagnosis of ASD, parents are presented with the challenge of raising a child with special needs while trying to find answers to their child's difficulties. The process of seeking a referral or diagnosis for a child with ASD can be a frustrating and exhausting experience, and although many parents observe and suspect significant delays early in their child's development (i.e., age 2 years), they are seldom able to obtain an appropriate diagnosis at the time of the initial evaluation and consultation (Howlin & Moore, 1997). For many families, the process of obtaining an answer to their concerns involves

an overwhelming number of visits to physicians, psychologists, and therapists as they seek an appropriate diagnosis; this time of waiting is reported to be associated with high levels of parent stress (Schall, 2000). Oftentimes, the confirmed diagnosis or answer to the parents' concern does not come until years later (i.e., age 6 years), therefore delaying access to critical early intervention services (Smith et al., 1994).

Although obtaining a comprehensive medical or psychological evaluation used to diagnose a child with ASD can be taxing for both the child and the family, some parents report being relieved once they learn their child has an identifiable diagnosis and that some of the answers to their questions will now be available (Hutton & Carron, 2005; Fleishman, 2004). Others, however, report feelings of grief, shock, guilt and anger as they are often forced to adapt the existing social and developmental expectations they had for their child.

While the degree of severity in presentation of symptoms differs among individuals with ASD, parents of individuals with ASD are faced with unique challenges and stressors due to unanswered questions surrounding the diagnosis, such as the severity and duration, as well as the pervasive difficulties of adhering to social norms (Bristol, 1984). Even parents of children who are considered to have high-functioning autism (HFA) report elevated levels of stress, as compared to parents of typically developing children (Montes & Halterman, 2008). Adjustments must often be made to the family system in order to cope with the challenges associated with having a child with autism (Alteire & von Kluge, 2009).

The presence of extreme disruptive, problematic, or abnormal behavior is among the most salient contributors of elevated parental stress associated with raising a child with autism (Benson, 2006; Hastings, 2003; Lecavalier, Leone, & Wiltz, 2006; Schieve, Blumberg, Rice, Visser, & Boyle, 2008; Tomaik, Harris, & Hawkins, 2004). When a child displays problematic

behaviors across home, school, and community environments, parents report restrictions of family life, such that their family becomes socially isolated in order to avoid the possible risk of embarrassment from their child's problem behavior within a social setting (Gray, 1994). Parents of children with ASD without severe behavior problems report decreased stress over time as the child develops but parents of children who continue to exhibit problem behaviors over time, continue to report elevated levels of stress (Gray, 2002). Child behavioral factors (e.g., hyperactivity, demandingness, and disturbed mood) directly contribute to stress within the family system even for children diagnosed with HFA (Rao & Beidel, 2009). This suggests that, among the difficulties parents of children with autism are face, dealing with difficult behaviors their child displays has a significant effect on parental stress and family functioning.

Due to the evident relationship between increased behavior problems that are characteristic of ASD and increased parental stress, it would be prudent for medical and mental health professionals, service providers, and educators to explore evidence-based treatments for decreasing problem behaviors of children with ASD. The benefit of evidence-based treatments to reduce problem behaviors is two-fold. First, the reduction of challenging behaviors through established behavioral treatments may decrease difficulties that interfere with the child's ability to function at their full capacity across a variety of settings and situations (Lovaas, 1987). Therefore, decreased behavior problems are likely to improve the quality of life of the child and maximize their strengths and promote development. Additionally, parents have reported decreased levels of stress as a result of reductions in their child's behavioral difficulties achieved through behavior modification programs (Dillenburger, Keenan, Gallagher, & McElHinney, 2002).

History of Special Education and Parental Involvement

Even after receiving a diagnosis of ASD for their child, parents will be faced with the overwhelming task of working with a host of medical and/or school professionals to determine how best to help their child (Dillenburger et al., 2002). For example, they will work with school personnel to develop an individualized education plan (IEP) for their child so his or her educational needs can be appropriately met.

Historically, special education has not always been a legal right and appropriate resource to which students with disabilities and their families have had access. Prior to 1975, it was legal to exclude children with severe disabilities, including those with ASD, from public schools due to their disabilities and the cost of providing specialized education to these students (*Mills v. Board of Education of the District of Columbia*, 1972). There was seldom parental involvement in the process of education planning, and parents of children with disabilities were left to depend on the professional judgment of school personnel, without the option of taking an active role in advocating for appropriate education for their child (Spann et al., 2003). The lack of parental involvement in special education planning can be partially explained by the emergence of rights and regulations related to the education of individuals with disabilities, and the absence of relevant legal regulations for parental involvement.

In 1975 the United States Congress enacted the Education for All Handicapped Children Act (EAHCA; also referred to as Public Law [PL] 94-142), which required that all public schools accept funds to provide students with physical and mental disabilities equal access to education. The National Education Association (NEA; 1978) considered EAHCA to be a civil rights act, rooted in landmark court decisions such as *Brown v. Board of Education* (1954), which rejected racial segregation and emphasized the importance of equal access to education to promote the

survival of society. Additional court decisions over the years that influenced the development of special education law have included *Pennsylvania Association for Retarded Citizens v. the Commonwealth of Pennsylvania*, and *Mills vs. Board of Education of the District of Columbia*, both of which ruled it to be unlawful to exclude children with disabilities from participation in a free and appropriate education. The authorization of EAHCA had five core purposes: (A) providing free and appropriate public education (FAPE) for all children with disabilities; (B) designing students' education (i.e., general and special education) and related services according to individual needs; (C) developing individualized education plans (IEPs) for students with disabilities; (D) educating students with disabilities within the least restrictive environment (LRE); and (E) providing parents with due process procedures, which includes parental rights to appeal decisions regarding their child's educational placement and planning (EAHCA, 1975; Yell, 2006).

The inclusion of IEPs for students with disabilities is among the key features of EAHCA, which can be understood as a legally-binding document designed to assist both the student and educator (NEA, 1978). An IEP consists of a written statement of the education program for a student with a disability, which includes information regarding the student's academic instruction, such as necessary supports and educationally related services. An IEP is used to ensure students with disabilities are provided with the opportunity to meet their educational goals, while being supported through related services, modifications, and accommodations. Further, the IEP ensures that the student is, in fact, provided with a free and appropriate education within the least restrictive environment, which are also key features to EAHCA (Hulett, 2009). At the initiation of PL 94-142, the IEP was considered to be developed based on a meeting of "people concerned for the child's education," including general and special education

teachers and school personnel such as the principal and school psychologist (NEA, 1978); parents were not initially listed as individuals to be involved in this meeting.

Although parent reports have indicated their role in the development and implementation of their child's IEP has, historically, been undermined even after their rights were clearly established (Vaughn, Bos, Harrell, & Lasky, 2001), the initiation of EAHCA did, in fact, emphasize parental involvement in special education planning. Specifically, under PL 94-142, parents were described as the most important participants in educational planning, second only to the child (NEA, 1978). Procedural safeguards were outlined in PL 94-142, which included parental rights to due process, starting with the parental right to request an evaluation for special education. Parental consent for testing was also required under PL 94-142, due to the possible stigmatization or limitation of rights to the child, should they be determined to have a mental or emotional disability. Additionally, the school was required to obtain parental consent to the program outlined within the IEP. If the parents did not consent to the IEP and believed the IEP does not sufficiently meet the student's educational needs, then parents had the right to seek an independent evaluation, or request a due process hearing before an impartial party (which excluded the school board, members of school board, or employees of the school district). During the due process hearing, the hearing officer would determine whether or not the school has ascertained sufficient data regarding the student's needs, and whether the school was providing appropriate education to the student. The teacher was also involved in the hearing, and was required to provide the hearing officer with the necessary information to suggest the program is sufficiently meeting the child's educational needs. If the school was unable to provide convincing evidence that the educational supports were adequate, then the hearing officer would decide that the school was not providing educational supports in accordance with

regulations outlined within PL 94-142. The aforementioned parental rights, including due process procedures, continue to be relevant to current special education law.

As with all disabilities, students with ASD were included under the protection of EAHCA (1975). However, it was not specifically mentioned as a disability category within the law because, at the time, autism was considered to be a rare and low-incidence disability. Instead, many of these children were mislabeled as being “seriously mentally disturbed” or as having “childhood psychosis”(Cooper, 1977).

In 1990, EAHCA was renamed as the Individuals with Disabilities Education Act (IDEA; PL101-476) and revisions were made to the original law (e.g., the phrase ‘handicapped child’ was replaced with ‘child with a disability’). Additional provisions made to the new IDEA included: (A) student transition services; (B) eligibility extension of autism and traumatic brain injury; (C) LRE environment expansions, and (D) determination of assistive technology devices and services by students’ IEPs. IDEA was, again, amended in 2004, during which additional provisions targeted the specific educational needs of children with ASD, including additional trainings for special education teachers on the needs of students with ASD (IDEA, 2004).

Another federal legislation that affected special and general education students was the 2001 No Child Left Behind Act (NCLB). The overarching purpose of NCLB was to provide all students with an equal opportunity to high quality education and to demonstrate, at minimum, proficient levels of academic achievement during standardized assessments as outlined through state academic achievement standards (NCLB, 2001). NCLB also required educators to rely on empirically-supported treatments in the education of students with disabilities. Although NCLB advocated for high levels of accountability of educational personnel for measurable growth, the use of scientifically supported instruction, and highly qualified teachers and paraprofessionals

(Yell, 2006), a lack of these factors led to increases in special education litigation, including litigation involving students with ASD (Hill, Martin, & Nelson-Head, 2011). Specifically, NCLB mandated parental access and participation and increased parental choice regarding education decision-making, therefore resulting in increased litigations in which parents of students with ASD requested specialized educational services that were initially denied by the school.

In 2006, Congress passed autism specific legislation for the first time in history. The Combating Autism Act further supports the needs of individuals affected by ASD (PL 109-416; Combating Autism Act [CAA], 2006). The enactment of this law required that federal funding be provided to the National Institute of Health (NIH) and Centers for Disease Control and Prevention (CDC) in order to promote research, screenings, treatment, and training in the area of ASD. The Act was reauthorized in 2011 (Combating Autism Reauthorization Act [CARA]; PL 112-32), which ensured the continuation of research, early identification and intervention, and the professional training for service providers (CARA, 2011).

One possible limitation of the current case law regarding the education of students with ASD is limited access to specific interventions requested by parents, including those that are empirically supported. Although schools are required to provide a FAPE, this does not mean that the child is entitled to receive any service that the parent requests, including specific evidence-based treatments (Turnbull, Wilcox, & Stowe, 2002). Schools are only required to provide “adequate” special education services and educational accommodations, though selected educational interventions must be supported through scientific evidence. However, this does not necessarily include providing services that will bring the student with disabilities up to the level of his or her peers, or maximizing the student’s learning potential (*Board of Education v. Rowley*, 1982). The notion that schools are only required to provide “adequate” special

educational services may be especially problematic for individuals on the autism spectrum, as best practices in educating students with ASD requires early and intensive intervention, with specialized instruction that is tailored to the individual needs of the child (Hill et al., 2011). This may limit a child's accessibility to evidence-based treatments within the school setting because the law does not support or advocate particular teaching methods (e.g., ABA). Still, throughout the process of identification, evaluation, and educational planning, parents have the right to due process procedures should they chose to appeal the decision made by the school (Turnbull et al., 1982) and these rights should not be overlooked. It is through this process that the parents can advocate for appropriate services, challenge the school's decisions, and evaluate the school's legal compliance as outlined in IDEA.

Unfortunately, many parents are not familiar with their child's rights under IDEA, and are not prepared to advocate for appropriate educational support. Even when parents are legally entitled to be equal partners in the development of their child's educational planning, parents have continued to report having no choices in the services received by their child (McWilliam et al., 1995). Many parents report a lack of sufficient communication regarding their child's education, and express frustration that school personnel are unwilling to consider the parents' perspective and suggestions (Maryland State Department, 2000; Tissot, 2011; Turnbull & Ruef, 1997). Additionally, parents report the process of entering special education to be traumatic, due to confusion surrounding the educational and legal jargon used within the IEP meetings and difficulty obtaining requested services (Stoner et al., 2005). Research-based recommendations for increasing parental satisfaction regarding their involvement in educational planning include providing training to increase parental knowledge of ASD and special educational services, including evidence-based educational practices and special education rights. Unfortunately,

many parents do not have access to sufficient training or are not provided with information for how to participate in such trainings (Hamad, Serna, Morrison, & Fleming, 2010).

Parental Empowerment

Not only do many parents have limited access to trainings related to their child's condition and treatment (Hamad et al., 2010), but the lengthy process of obtaining an appropriate diagnosis and securing necessary treatment involves feedback and recommendations from a long list of professionals, such as health professionals, community resource professionals, psychologists, occupational therapists, and physical therapists (Dillenburg, Keenan, Gallagher, & McElhinney, 2002). Additionally, there are often conflicting opinions among these professionals with regards to recommendations for treatment (Wilczynski & Christian, 2008), and parents are often disempowered in the decision-making process (Dillenburg et al., 2002). Because parental empowerment positively impacts treatment outcomes, there is a need for service providers to be devoted to increasing parental empowerment towards their child's treatment and education. Furthermore, parents who are empowered in the decision-making process report feeling more equipped to advocate for their child.

Empowerment as a research construct first emerged in the 1970s, and was studied across a broad range of professional fields including, politics, humanities, social sciences, and helping professions (e.g., Solomon, 1976; Berger & Neuhaus, 1977; Freire, 1983; Neruda, 1987; Dunst, Trivette, Davis, & Cornwell, 1988). As the study of empowerment across these domains developed, several broad definitions of empowerment emerged that encompassed the interaction between an individual and their daily social context (Akey, Marquis, & Ross, 2000). Thus, empowerment can be studied as both an individual and group phenomenon (Staples, 1990). It has also been studied as both a process and a state, and as knowledge, attitudes, beliefs, actions, or

abilities (Koren, DeChillo & Friesen 1992). In general, definitions of empowerment have included themes related to obtaining, developing, embracing, or giving power (Staples, 1990), a reduction of powerlessness (Solomon, 1976), an ability to influence others' behavior (Cochran, 1987), and access to control over one's life (Berger & Neuhaus, 1977; Zimmerman & Rappaport, 1988).

The process of empowerment encompasses three levels, including the individual level, the contextual level, and the transactional level (Akey et al., 2000). The individual level of empowerment refers to the characteristics and skills that an individual brings when approaching a particular situation, such as participation in the problem-solving process, motivation to exert control, and experiencing feelings of efficacy and control within the situation (Zimmerman, 1990, 1995; Zimmerman & Rappaport, 1988). The contextual level refers to the individual's access to resources (e.g., a community), and the response of the context (e.g., the community) to the individual's needs (Cornell Empowerment Group, 1989; Turnbull & Turnbull, 1996). The transactional level is described as the interaction between the person and the context, and the changes in behavior and outcomes that occur within the individual, or the context (Akey & Turnbull, 1996).

The current study is devoted to measuring empowerment in parents of children with ASD at the individual level, which is often described as "psychological empowerment," (Zimmerman, 1995) because it is considered to be an intrapersonal dimension that assists an individual's cognitive appraisals towards one's level of competence, motivation, and sense of self-esteem. Individual empowerment encompasses several dimensions, including cognitive appraisals of control, knowledge and skill development, and participatory, change-oriented behaviors (Zimmerman, 1990; Akey et al., 2000). The combination of these three dimensions suggests that

empowerment involves an individual's perceptions, skills, and behaviors towards control and a reduction of powerlessness with specific regard to the parent's ability to assess their child's needs and effectively advocate for supporting these needs across contexts (i.e., home, school, and community environments). Increases in empowerment occur when the individual has knowledge and information, competence, concrete skills, access to resources, and opportunities for change (Staples, 1990). In the current study, parents will be provided with training to increase their knowledge and skills in evidence-based treatments. Consistent with existing literature regarding empowerment, increases in knowledge and competence of evidence-based treatments may result in parental empowerment to advocate for such treatments within educational settings.

As the literature surrounding the construct of empowerment has evolved over the past 40 years, attempts have been made to measure empowerment quantitatively (Koren et al., 1992). Initial measures targeted several dimensions of empowerment in ethnic minorities. Specifically, constructs such as political empowerment, ethnic commitment and activism, and personal empowerment were measured among Latinos (Gutierrez & Ortega, 1991). These measures assessed levels of empowerment before and after the participants were involved in an intervention that targeted their level of empowerment, and outcomes of the study allowed researchers to measure empowerment quantitatively. Despite the support for the development of assessment tools that were sensitive to conditions related to empowerment, no measures of general empowerment existed within the literature until the development of the Family Empowerment Scale (FES; Koren et al., 1992).

The FES was developed based on feedback from individuals associated with a federally-funded, community mental health organization for children and families affected by mental, emotional, and behavioral disorders (Research and Training Center on Family Support and

Children's Mental Health [RTC]; Koren et al, 1992). Conversations among staff, researchers, and family members of children with severe emotional disabilities, who indicated states of empowerment related to the child's functioning, led to the development of the FES. Using existing theories of empowerment, along with qualitative reports at RTC, the framework of empowerment from which the FES was built included two dimensions: 1) the family member's level of empowerment, and 2) the way in which the family member expressed empowerment. In the first dimension, the FES assesses three levels of empowerment, including, the family level, the service system level, and the community/political level. In addition to measuring the family members' empowerment at each of the three levels, the FES simultaneously measures the three areas of empowerment by assessing the parent's attitudes (i.e., reported feelings and beliefs), knowledge (i.e., what the parent knows), and behaviors (i.e., action taken by the parent).

The family system refers to day-to-day situations within the home, and includes items that assess the respondent's level of perceived control and confidence in their ability to support their child, their knowledge of child's condition and methods of resolving their child's problems, and their skill in dealing with problems their child may face (Koren et al., 1992). The service system includes the parents' perceived ability to interact individuals and agencies that may provide services to the child. Items on the FES that measure parental empowerment within the service system include items that assess the respondents' attitudes towards their parental right to require consent prior to beginning services suggested by professionals, knowledge of steps to take in order to obtain appropriate services for their child, and their level of involvement with service providers (i.e., on-going collaboration with service providers). The community political system encompasses parents' perceptions and attitudes towards community services and local and general legislative systems that influence services provided to the child. The FES measures

empowerment at the community-political level by assessing parental attitudes towards their ability to advocate for their child (as well as other families within the community) and parental knowledge of service systems and legal rights related to their child's treatment and education (e.g., knowledge of rights under special education law). The community-political level also includes actions taken by respondents in order to maximize their child's access to appropriate treatment and education (e.g., contact with legislators regarding bills or issues concerning children).

Although FES has well established reliability and validity in assessing parental empowerment as measurable construct, research regarding the implications of scores reported through the FES is lacking (Koren et al., 1992). No studies using the FES have explored the developmental process that parents of children with disabilities experience with regard to empowerment. A number of researchers have suggested that it is likely that parents first develop a sense of empowerment with their own child and family system, prior to gaining empowerment to assist other individuals within their community and service systems (Koren et al., 1992; Friesen, 1989; Fine & Borden, 1989). Additionally, there have been few empirical studies regarding methods and interventions for increasing parental empowerment (Koren et al., 1992). The current study aims to assess the usefulness of increasing knowledge of evidence-based treatments as a method of increasing parental empowerment.

Applied Behavior Analysis

Because parents of children with ASD are entitled to be involved in educational planning for their child, their knowledge of evidence-based treatments can better equip them to be empowered to advocate for these services within the school setting. However, access to information regarding evidence-based treatments for children ASD has not always been readily

available to parents upon receiving a formal diagnosis of ASD for their child. More recently, a number of documents and resources have been made available to parents and treatment providers to provide them with an overview of treatments that are grounded in empirical research (DeMyer, Hingtgen & Jackson, 1981; Herbert, Sharp & Guadiano, 2002; Hingtgen & Bryson (1972); Kahng, Iwata, & Lewin, 2002; Matson, Benavidiz, Comptom, Paclawskyj, & Baglio, 1996; National Autism Center, 2009; National Professional Development Center on Autism Spectrum Disorders, 2011; National Research Council, 2001). Still, many parents have not become aware that these documents exist and may continue to experience difficulty selecting a treatment for their child due to an inability to weigh the pros and cons of existing interventions based on scientific evidence (Association for Science in Autism Treatment, 2011). They may also not be able to access these treatments for their child.

As the prevalence and incidence of ASD over the past fifty years increased, so too has the scientific research devoted to the education and treatment of individuals with ASD. Among the most well researched and utilized areas within the empirical research on ASD interventions has been the field of ABA, which has consistently demonstrated rapid functional skill acquisition that can be generalized to the natural environment (Frea & McNerney, 2008). Defined as the scientific study of the effects of environmental variables on socially significant behavior, the field of ABA is devoted to objectively defining socially significant behavior for purpose of developing interventions that reliably produce behavioral improvements (Cooper, Heron, & Heward, 2007). ABA emerged from the field of behaviorism and was influenced by the work of John B. Watson in the early 1900s, during which he argued that the field of psychology should not be conceptualized through the previously dominating understandings of consciousness and internal mental process, but should instead emphasize the study of observable behavior. Watson

advocated that human behavior should be studied through direct observation of the relationship between environmental stimuli (S), and the responses (R) they evoke (often referred to as S-R learning). In the 1930s, Skinner expanded on the work of Watson by formally introducing the experimental branch of behavior analysis, which defined two types of behavior: respondent behavior and operant behavior. Respondent behaviors could be understood as S-R behavior, or reflexive behaviors. Operant behaviors are those behaviors that are elicited based on the environmental consequences that followed the behavior in the past, rather than preceding variables. An important contribution made by Skinner in analysis of behavior was the conceptualization of behaviors through an operant three-term contingency (also called S-R-S learning). The notion of the three-term contingency explains that behaviors are influenced by stimulus changes that have followed behaviors in the past, and that the environment “selects” a large part of learned behavior.

From the 1930s to the 1950s, Skinner expanded his work by conducting large amounts of laboratory studies to demonstrate principles of behavior by using experimental behavioral analytic methodology (Cooper et al., 2007). Skinner’s research involved the study of nonhuman behavior in order to study the behavior of humans, and then later applying the behavior analytic methods to human subjects. A pivotal research study in the application of behavioral analytic techniques to individuals with disabilities occurred in 1949 with an 18 year-old male with severe developmental disabilities (Fuller, 1949). In this study, an arm-raising response was conditioned by injecting a small amount of warm sugar-milk solution into the participant’s mouth each time he raised his arm. The arm-raising response was learned within four training sessions.

The application of ABA with individuals with autism first occurred in the 1960s, during a time in which it was believed that children with autism were not capable of learning (Schreibman

& Ingersoll, 2005). Around this time, research emerged suggesting that children with autism were, in fact, capable of learning through operant discrimination learning techniques involving contingencies of reinforcement following newly learned behaviors (Ferster & Demeyer, 1961, 1962). Future studies expanded on this research to demonstrate the effectiveness of the systematic application of reinforcement to teach new behaviors in children with autism (Schreibman, 1988). Early studies in the field of ABA were largely devoted to addressing isolated behavior. However, later research demonstrated the application of ABA techniques to target a wide range of behaviors that are characteristic of children with ASD, such as self-injurious behavior, stereotypy, aggressive behaviors, and tantrums (Schreibman & Ingersoll, 2005). Behavioral analytic techniques have also been used to increase language, interpersonal skills, academic skills, self-care, and self-regulation to individuals on the spectrum (National Autism Center, NAC, 2009). Behavioral interventions that have been supported through ABA research have also been considered “established treatments” for children and adults with autism in reducing problem behaviors and teaching functional, alternative behavior and skills through principles of behavior change (NAC, 2009). Interventions deemed effective for individuals with autism within the field of ABA have demonstrated a high degree of scientific merit and should be considered during behavioral and educational planning for individuals on the autism spectrum.

In addition to the large amount of support for the use of ABA as an effective treatment for individuals with ASD, there has been an increased emphasis on early and intensive intervention, family involvement, and skilled clinicians (National Research Council, 2001). However, much debate continues to surround the parameters of early and intense intervention, with many behavior specialists advocating that ABA therapy begin at the time that a diagnosis of

autism is first suspected (Frea & McNerney, 2008), and that the child receive a minimum of 25 per week of intensive therapy (National Research Council, 2001). Despite the large amount of scientific support for ABA therapy, many parents may not know how to access these services (Hamad, et al., 2010) and may be confused by the ABA techniques and terminology (Frea & McNerney, 2008). Parental knowledge of ABA techniques is of particular importance, given the expectation that parents learn ABA methods included in their child's program in order to generalize skill acquisition across environments (Sherer & Schreibman, 2005).

The field of ABA encompasses a long list of specific interventions and techniques and, as a result, individualized treatment plans will vary based on the child and the behavior therapist. However, there are several key components of ABA that are used by therapists to assess behavior, and to promote subsequent behavior change. These key components are addressed below. Different professionals (e.g., behavior analysts, interventionists, clinician) and family members can serve as change agents. For the purposes of consistency, the term 'therapist' will be adopted in this document because it represents all of these change agents and is commonly used in the field of ABA.

As mentioned in the discussion of the early foundations of behavior analysis, Watson's emphasis on observable behavior was critical in the shift towards the scientific study of behavior. The definition of behavior through observable and measurable terms remains an integral concept within the study and application of ABA. Specifically, behavior analysts develop a clear and objective definition of the target behavior that is based on observable characteristics (Cooper et al., 2007). The therapist delineates the boundaries of a behavior by discriminating examples of the behavior from non-examples (those behaviors that would be excluded from the definition). The reason ABA has such a strong emphasis on the use of objectively defined behavior is to

ensure that instances of behavior and changes in behavior due to environmental manipulation are being measured reliably across observers. It is also important that the behavioral definition possess validity that allows for replication in future research and application. The development of a clear and succinct behavioral definition is, generally, among the first components of a behavioral assessment and intervention.

The three-term-contingency (Cooper et al., 2007) is critical to effective selection and/or implementation of treatments derived from ABA. Within the application of ABA, the temporal loci of stimuli are assessed in order to better understand the behavior and its function, which is useful in developing an intervention to improve behavior. This three-term contingency of behavior, or behavioral pathway, is often referred to as the antecedent (A), behavior (B), and consequence (C); also called the ABCs of behavior analysis. Antecedents can be understood as environmental variables and conditions that precede the behavior of interest (Cooper, et al., 2007). Because every behavior occurs within a context (e.g., a particular situation or under certain antecedent conditions), antecedents provide information regarding motivation and learning. A consequence, on the other hand, is a stimulus change that occurs after the behavior of interest. When the consequences occur immediately and are related to the current motivational state, the consequence may have influence on future behavior. However, some consequences have little effect on future behavior. Conceptualization of behavior in terms of antecedents and consequences allows one to determine what is learned and why.

Another concept critical to behavior change through ABA is the understanding of learning and behavioral change through operant conditioning. Operant conditioning refers to the process in which a functional consequence that follows a behavior predicts the likelihood of the type of behavior that will occur in the future (Cooper et al., 2007). Behavior change that occurs

through operant conditioning can be explained through two principles of behavior, including reinforcement and punishment. Reinforcement is the most important and preferred principle of behavior change in ABA, and is a key element in most behavioral intervention programs.

Reinforcement refers to the process in which behavior is followed (closely in time) by a stimulus event (i.e., consequence) that results in an increase in the future frequency of that type of behavior under similar conditions. Reinforcement can be either positive or negative, with positive reinforcement occurring when a new stimulus is added to the environment in order to increase the frequency of the behavior, and negative reinforcement occurring when an already-present, aversive stimulus is removed from the environment (or reduced in intensity), resulting in an increase in the frequency of a given behavior. Punishment, on other hand, is the process in which a behavioral response is followed (closely in time) by a stimulus event that results in a decrease in the likelihood that the behavior occurring in the future under similar conditions.

By understanding principles of reinforcement and punishment, the therapist is able to hypothesize the functional relationship between the target behavior and one or more of its controlling variables (Cooper et al., 2007). In ABA, there are four predicted functions of behavior that describe the relationship between the behavior and controlling variables, including 1) tangible, 2) escape/avoidance, 3) social/attention, and 4) automatic. Tangible reinforcement refers to desired items or events (e.g., engaging in aggressive behavior in order to gain access to a desired television show or a preferred edible or toy). Escape/avoidance is a type of socially-mediated negative reinforcement in which the behavior is learned as a result of terminating or postponing an aversive or non-preferred event (e.g., engaging in disruptive classroom behavior resulting in the child being sent out of the classroom, and therefore, escaping instructional demands). Attention is a form of socially-mediated positive reinforcement during which the

individual engages in a behavior in order to gain immediate attention from others (e.g., engaging in disruptive classroom behavior in order to get reactions such as facial expressions, laughter, or reprimands from peers or teachers). Automatic reinforcement can be described as a behavior that provides immediate reinforcement and occurs independently of variables in the social environment (Wilder & Carr, 1998). Additionally, automatic reinforcement can be understood as engagement in a behavior to alter a physiological state. These four functions of behaviors are used to explain “why” the individual is engaging in the behavior (e.g., “Is the student getting something?” or “Is the student getting out of something?”). Once the therapist has identified the hypothesized source of reinforcement for the target behavior, the hypothesized function is used to develop an intervention to decrease the occurrence of the problem behavior. Oftentimes, the intervention involves providing the individual with the opportunity to gain access to the desired reinforcement by engaging in an alternative, adaptive, and more socially-appropriate behavior, instead of engaging in the problem behavior. In behavior intervention plans that are grounded in ABA principles, the therapist can promote behavior change by altering antecedents or consequences in the environment, once the function of the behavior has been hypothesized. Oftentimes, behavior change occurs gradually through shaping, which can be understood as the use of differential reinforcement to gradually alter a response class (Cooper et al., 2007). Through shaping, the therapist differentially reinforces successful approximations that resemble the desired behavior until the individual is able to produce the desired response. For many individuals with ASD, there are deficits in fundamental skills, such as language, that their typically developing peers acquire automatically (APA, 2000). In order to promote the development of these skills in children with ASD, behavior therapists have been able to use shaping to gradually teach new behaviors that did not previously exist within the child’s behavioral

repertoire. For example, shaping is often used to teach language during which vocal responses that meet a pre-determined criterion are reinforced (Newman, Reinecke, & Ramos, 2009). Then, only subsequent responses that are as good as or better than those of previously emitted responses are reinforced. The reinforcement of successive approximations to the target responses may then be “shaped” to more exact speech and functional language for the student.

In order to promote positive behavior change, ABA theory emphasizes the need for the therapist to maintain instructional control, which refers to a positive working relationship between the therapist and the learner, which facilitates maintenance of appropriate behavior (Falcomata et al., 2008). Instructional control has been established when the learner consistently responds to a task or demand presented by the therapist, and maintains a steady level of responding for the duration of the teaching session. There are several ways for therapists to gauge the level of instructional control that has been established. For example, instructional control may have been established if the learner responds when the therapist calls the learner’s name, or responds to a demand that has been placed by the therapist. Also, if the learner shows interest in the learning opportunities presented by the therapist (e.g., is the learner excited to see the therapist, or does he/she find the presence of the therapist to be aversive?), then instructional control exists between the learner and therapist. Alternatively, instructional control has been established when the learner complies with the demands placed by the therapist, which suggests that the learner has paired compliance with reinforcement. For many individuals on the spectrum, the therapist or learning environment may serve as an aversive condition, which results in an increase in problem behaviors. The learner may display problem behaviors resulting in escape or avoidance of the instructional demands, therefore increasing the frequency of problem behaviors. In order for the behavior change program to be effective, the therapist must

establish instructional control. One method for increasing instructional control is a procedure known as “pairing,” which refers to the process in which the therapist and the instructional conditions or settings are paired with reinforcement, therefore allowing the therapist to acquire reinforcing properties. Through pairing, the therapist or instructional conditions, alone, serve as a reinforcer for the learner.

As mentioned previously, the field of ABA has had a pivotal impact on the education and treatment of individuals with ASD because it enjoys great empirical support for this population (Frea & McNearney, 2008). Although the range of methodology and treatment application is based on individual characteristics of the learner and therapist, the critical aforementioned components of ABA therapy (e.g., reinforcement/punishment, identification of functions and contingencies of behavior, and instructional control) that underlie all ABA programs have allowed for treatment programming that is unique to the different profiles displayed by individuals on the spectrum.

ABA has demonstrated effectiveness in both decreasing problem behaviors (e.g., aggressive; disruptive behaviors) and increasing prosocial behavior (e.g., compliance; social responding). One specific area in which ABA has differed from previously utilized styles of behavioral intervention for individuals with ASD is the increased emphasis on teaching communication, which derived from Skinner’s analysis of verbal behavior (Axelrod, McElrath & Wine, 2012). Skinner (1957) proposed that language is a learned behavior that is under the functional control of environmental variables; which explains that verbal behavior is a behavior that is socially mediated by another person’s behavior. Skinner’s conceptualization of verbal behavior is relevant to the research and practice of ABA with individuals with ASD, as verbal behavior interventions have been used to target the communication deficits that are characteristic

of individuals with ASD (Axelrod et al., 2012). Skinner (1957) referred to the basic units of verbal behavior as “verbal operants,” which explain the functional relationship between the response displayed by the learner, and the controlling variables. One of the most elementary verbal operants introduced by Skinner, and includes in the instruction of verbal behavior in ABA, is the *mand*. A mand refers to the speaker’s request (by asking, stating, demanding or implying) what he or she wants (Sundberg, 2007). The mand is generally the first verbal operant displayed by human children (Bijou & Baer, 1965; Novak, 1996) and allows children to gain access to desired reinforcers, such as preferred edibles, toys, activities, attention, or removal from aversive stimuli (Sundberg, 2007). Because a delay in communication is a common deficit among children with ASD, many of these children are unable to appropriately mand for desired reinforcement. As a result, children who can not effectively communicate what they want are likely to engage in increased rates of problem behaviors in order to gain access to preferred items or activities (Carr & Durand, 1985; Sundberg, 2007). ABA therapy has been an effective method of teaching basic verbal operants, including mands, and has resulted in impressive language gains for many children on the autism spectrum (Rosenwasser & Axelrod, 2001). Furthermore, once a child has acquired manding skills, they are able to further increase his or her verbal repertoire, which will be crucial in future social interactions across home, school, and community environments.

Despite the large amount of empirical support for the use of ABA in the education and treatment of individuals with ASD, a lack of application of ABA in the general education environment remains (Axelrod et al., 2012). Even with current federal and state legislations that require the use of evidence-based instructional practices, many schools are not practicing ABA within special or general education classrooms. This is unfortunate, especially due to the support

for positive academic and behavioral outcomes for both special and general education students when ABA strategies are implemented in the classroom (Bloch & Axelrod, year; Axelrod et al., 2012). Additionally, children with ASD who receive intensive ABA therapy 20-40 hours per week during their early years of development demonstrate superior outcomes in skills such as language comprehension and intellectual functioning as compared to similar students who are educated within an eclectic special education classroom (Cohen, Amerine-Dickens, & Smith, 2006; Eldvik et al., 2006). Legally, the weakness in the provision of appropriate services for students with ASD is protected through current federal special education law, which states that, schools are only required to provide “adequate” services to students with disabilities, without the endorsement of any single type of instruction. Unfortunately, for many students with ASD this may limit their access to ABA therapy within the school, and their education may consist of less efficacious instructional programs.

Another issue relevant to the education of students with ASD enrolled in public schools is the lack of professionals who have received training in the application of ABA programs (Maurice, Mannion, Letso, & Perry, 2001). Additionally, qualified practitioners who have been trained in providing evidence-based treatments may be unavailable due to the large demand (Johnson & Hastings, 2002). There are also geographical differences in the accessibility of trained consultants. For example, [results of the 2010 U.S. census data have](#) indicated that the largest-per capital concentrations of board certified behavior analysts (BCBA) were located in Northeastern states, Florida, and California (Behavior Analyst Certification Board, 2012). Midwestern states, on the other hand, were among the regions with the fewest BCBAs per capita (i.e., less than two BCBAs per 100,000 residents). Therefore, not only should parents of children with ASD be supported as they advocate for appropriate educational services for their child, but

parents themselves should be provided with training to increase their knowledge of evidence-based treatments. It is possible that, by increasing parental knowledge of evidence-based treatments, they may be better equipped to advocate for the specific needs of their child.

Parent Training

With the growth of research and recognition of ABA as an evidence-based treatment, there has been an increased emphasis on training parents to be active participants in treatment delivery. Individuals who have been trained to implement ABA techniques with a high degree of fidelity have included parents, teachers, paraprofessionals, and BCBAs. In order to circumvent the shortage of trained ABA professionals to provide services to children with ASD, parents of children on the spectrum have been increasingly encouraged to serve as behavior therapists by implementing ABA interventions within the home environment, starting at the earliest age possible (National Research Council, 2001). Although broad conceptualizations of what ABA therapy entails may vary, programs that have been considered “true” ABA programs strive to teach a broad range of skills (e.g., cognitive, social, academic, leisure, and adaptive) and to assist the individual in generalizing these skills to the natural environment (Steege, Mace, Perry, & Longnecker 2007).

There has been a large amount of published research within the ABA literature indicating the effectiveness of parent-training and parent-implemented methods of producing behavior change (e.g., Hawkins, Peterson, Schweid, & Bijou, 1966; Wahler, 1969; Zeilberger, Sampen, & Sloan, 1968). Parents can be successfully trained to implement behavior intervention techniques and effectively promote behavior change across a wide range of behavioral domains. Not only is parent training supported within the existing literature suggest that parents can, in fact, successfully implement behavioral interventions, but parent education is also considered a

critical component of behavior intervention plans for children with ASD (National Research Council, 2001).

Children on the spectrum require additional support from family members in order to make their home environment developmentally stimulating. For typically developing children, observations and interactions with family members, alone, provide them with the opportunity to learn from other's behavior (Bandura, 2001; Dunst et al., 2001; Hart & Risley, 1992, 1995). Unlike their non-disabled peers, a socially-enriching home environment alone is not sufficient to promote developmental skill acquisition (Symon & Boettcher, 2008). Instead, parents of children with autism must receive training in how to teach social skills, including language and communication, and also strategies for decreasing problem behaviors. Studies that have supported parent training and the role of parents as behavior therapists have suggested that parents have successfully demonstrated behavior change in the following areas: teaching communication skills, including verbal skills (Charlop-Christy & Carpenter, 2002; Koegel, Symon, & Koegel, 2002; Laski, Charlop, & Schreibman, 1988; Miller & Sloane, 1976; Siller & Sigman, 2002) and augmentative communication (Granlund, Bjork-Akesson & Olson, 2001; Sigofoos et al., 2004; Stribel, 1999); reducing challenging behaviors (Koegel, Bimbela, & Schreibman, 1996; Koegel et al., 2006); increasing homework completion (Koegel et al., 2005); decreasing food over-selectivity (Brown, Spencer, & Swift, 2002); teaching adaptive skills, including self-help skills (Katz & Kenig, 1985); and improving social interactions and play (Siller & Sigman, 2002).

One on-going limitation of the parent-training literature is a lack of generalization of treatment fidelity across home and treatment settings (Miller & Sloane, 1976). Although parents can be successfully trained to promote behavior change in their children while in a clinical

setting, the same degree of behavior change may not be generalized when outside of the control of the clinical setting (i.e., the home and community environments). Methods of increasing generalization across home and clinic environments have been suggested and supported by including the following generalization procedures for parent training programs: 1) use specific instruction, 2) include visual and auditory models, 3) use examples and non-examples, and 4) use video-recording to review performance and practice after receiving feedback regarding performance during video-recording (Koegel, Glahn, & Nieminen, 1978).

Another gap in the existing research regarding support for parent training is the lack of research regarding the most effective methods of parent training (Crockett, Fleming, Doepke, & Stevens, 2007). Specifically, there have been only a few studies that have systematically compared the most efficient and cost-effective methods of delivery parent trainings. These few studies that have explored methods of training parents in implementing behavioral interventions by comparing parent training by peers (i.e., other parents) to training from professional staff (Neef, 1995). Across both conditions (peer-trained and professional-trained), parents were trained in discrete trial training (DTT; a behavior analytic technique that includes teaching a specific skill through simplified and structured steps, one step at a time) (Smith, 2001). Through instructional techniques including trainer modeling, repeated practice, and trainee feedback (e.g., praise for correct performance), treatment protocols can be successfully implemented by parents. Across both conditions (i.e., peer-trained and professional-trained), parents demonstrated 85% mastery in implementing behavior intervention program. Additionally, parents in both training conditions were able to maintain the correct use of these skills during follow-up assessments, which occurred four to six weeks following the training phase, with most children demonstrating positive growth when comparing their performance relative to baseline. Unfortunately, this

study, demonstrated a lack of generalization of treatment skills across environments, which occurred in both training groups (Neef, 1995), indicating that generalizability continues to be a relevant problem in parent training programs (Baker, 1989).

A review of the parent training literature indicates that existing programs have strengths and limitations (Crockett et al., 2007). Training programs that have the richest evidence of efficacy have included in vivo demonstrations for delivering components of behavioral intervention programs, participation in role-play and direct practice of treatment program techniques, and frequent feedback regarding performance (Crockett et al., 2007; Koegel et al., 1978). Suggestions for future research have included continued exploration of methods that are most effective in training parents to serve as behavior therapists, specifically in natural environments, such as the home (Crockett et al., 2007). The use of web-based instruction as a method of providing parent training, an emerging area of research, is one way in which training within the home environment may occur, which was explored in the current study.

Adult Learning

When considering methods of delivering parent training, it is necessary to integrate instructional methods for adult learners that have been evidence-based. Specifically, what are the most efficient methods for facilitating learning in adults? Several considerations must be made when answering this question and developing adult learning programs, with the first being course components. An adult training program that strives to achieve some level of knowledge acquisition must include clear and consistent training objectives (Motangue & Knirk, 1993). Well-developed training objectives are both measurable and observable, and accurately reflect the content that will be presented and evaluated in the class. Not only do training objectives provide the learners with an outline for what is to be covered, but it decreases the learners'

anxiety and increases the learners' confidence, as they are able to preview the content of the course and predict their ability to master the material. It is recommended that, within the course objectives, the instructor provide learners with specific instructions regarding how the learner will demonstrate mastery, how their learning will be measured, and standards used to specify sufficient performance. These objectives should be embedded throughout the course and the instructor should ensure that all instruction is consistent with the course objectives. The mismatch between course objectives and instruction has been an ongoing problem evident in the adult learning literature. Sometimes, in traditional classroom instruction there is a mismatch between the course objectives and the information that is presented in class. The most effective instruction occurs when course curriculum and assessment accurately reflect the training objectives.

Once clear training objectives have been identified and embedded throughout the curriculum, instructors need to be aware of the specific instructional techniques that are able to best facilitate knowledge acquisition in adult learners. Optimal learning outcomes occur when consideration is given to how the learners are spending their instructional time. During instructional time, the instructor should be vigilant to develop instructional activities in which the learners are actively engaged in the learning process (Montague & Knirk, 1993). Increasing instructional time alone is not a sufficient method of maximizing learner outcomes. Learners have a limited ability to absorb and integrate new information at a given time, and lengthy training periods are likely to cause “burn out” and “information overload” when learners are presented with excessive amounts of information. Instructors should mix and vary the activities (including mastered information and newly presented information) within the session to increase the learners' time on-task through a variety of learning and practice opportunities. Another way

to circumvent the problem of information overload through lengthy instruction is to segment the instructional material and distribute it over shorter, more frequent sessions. Better learning outcomes occur when learners have time to practice the material over time, rather than lengthy, mass practice.

The quality of time spent in instruction can be maximized by making the instruction explicit by providing learners with cues for the learning objectives (what is going to be learned) and guided practice that requires that learners apply the material (Montague & Knirk, 1993). Techniques that have been successful in improving comprehension of the material include: allowing the learners to preview the material through summaries and outlines; presenting pictures and diagrams that show the relationships among concepts; providing learners with concrete examples and non-examples; assigning literature that requires the learner to process and respond to the material (e.g., inserting questions within the texts that require them to infer or apply information); asking learners to relate new information to what they already know (i.e., chunking); and requiring students to construct their own diagrams or notes to aide comprehension.

To further facilitate an instructional setting that is conducive to adult learning, instruction should be presented in a sequential and integrated manner (Montague & Knirk, 1993). Simpler materials should be presented first, and future content should expand on this information by presenting the material in a progressive, logical sequence. Student performance should also influence the pace of the instruction; that is, instructors should gauge the students' level of mastery of the content and provide additional instruction in areas that are in need of additional clarification. Student control over the pace of the course also motivates student learning and facilitates learner confidence. In addition to providing learners with control over the pace of

instruction, autonomy can be further facilitated by requiring students to develop their own daily training goals, track their progress towards these goals (using charts and graphs as visual representations), and develop contingencies of reinforcement in which they reward themselves for attaining their goals. As students take more responsibility in their work, they are likely to be more successful in their achievement.

Methods of evaluating learners' level of knowledge acquisition are another area of adult learning that should be considered during the development of any training program. As mentioned previously, practice of course material over time yields superior learning outcomes (Montague & Knirk, 1993). This is especially true when performance is measured on tests of retention of instructional content. One way to motivate students to attend to the instructional content and be actively engaged in instruction is to provide frequent testing of material. Learners participating in courses or training programs that have frequent tests outperform students who are less frequently tested. Through frequent testing, students are better able to track their performance towards mastery and instructors are able to identify learning problems that need to be corrected and to fill in the gaps when learners demonstrate an area of weakness within their skills set. Specific test items should be consistent with training objectives, and items should assess a learners' ability to practically apply the information. Furthermore, traditional, comprehensive exams are not the only method to effectively measure knowledge acquisition. Additional activities and assignments such as laboratory exercises, oral and written tests and quizzes, group assignments, out-of-class assignments, and classroom discussions can also sufficiently reflect what has been learned.

Despite the existing support for the use of frequent testing during training programs, it is important to note that, assessing the effectiveness of instruction should not be exclusively

measured by the pace of student learning or by their performance on a final test of acquired knowledge (Montague & Knirk, 1993). Instead, the application of this knowledge in real-world settings and their ability to demonstrate mastery of the instructional content outside of the classroom may be a more accurate method of assessing the quality of the instruction. Specifically, although a student may have mastered the instruction as measured by a test of knowledge acquisition, true mastery of content and skills is more accurately assessed through the learners' ability to generalize and apply this knowledge in contexts outside of the classroom.

Also relevant to the study of effective instructional practices for adult learning is the amount of feedback provided to learners and the methods in which this feedback is delivered. Explanatory and explicit feedback is a necessary component in guiding learners towards mastery of the instructional content (Montague & Knirk, 1993). Instructors should be tolerant of student errors, recognizing that it is part of the learning process. Feedback should be both positive and constructive, meaning that instructors should point out strengths and weaknesses on assessments of learning and provide social rewards (e.g., praise for expended effort and accurate performance). Immediacy of feedback is also a key feature of effective feedback, and timely comments regarding the accuracy of their performance will assist students correcting their errors. This is no single method of delivering feedback that demonstrates superiority, though specific guidelines have been suggested for effectively delivering feedback. One way in which instructors can provide feedback is describing the method for arriving at the correct answer on a given item, even during instances in which the student answered correctly. Instructors should be aware, however, that it is possible for feedback to be “overdone” and can result in poor long-term performance. Excessive feedback, especially when learners are repeatedly told by the instructor what he/she is doing wrong on each attempt, can be detrimental to the learner's long-term

knowledge acquisition. Positive and productive relationships among learners and instructors are characterized by a trusted connection, in which students seek and value the instructor's feedback.

History and Use of Web-Based Instruction

Current trends in higher education and adult instruction have emphasized the use of the technology as a resource for increasing knowledge in adult learners, while reducing the amount of time spent by trainers and trainees in a traditional classroom (Buerck, Malmstrom, & Peppers, 2002). The use of web-based instruction has become an increasingly popular method of delivering instruction across a large number of institutions and organizations (Sitzmann, Kraiger, Steward, & Wisher, 2006). Early research on the use of distance education programs in the 1980s and 1990s, based on use of interactive television and computer assisted technology, indicated that these technology-based methods of instruction result in as favorable learning outcomes as traditional, in-person instruction (Daily, McClelland & Yang, 1994; Keck, 1992; Lia-Hoagberg, Vellenga, Miller & Li, 1999; Nyamathi, Chang, Sherman, & Grech, 1989; Russell, 1992). As technology has become a more integrated part of every day life, the use of web-based instruction has expanded to the fields of higher education, industry, and government (including military; Sitzmann et al., 2006).

When comparing learning outcomes of web-based instruction to those of traditional, classroom instruction, commensurate levels of growth occur in the areas of knowledge acquisition, length of training, and trainee satisfaction across both methods of instruction (Sitzmann et al., 2006). Sufficient growth in overall knowledge acquisition has been demonstrated during web-based and classroom instruction; however, differences have been observed when both declarative knowledge and procedural knowledge have served as the dependent measures. Declarative knowledge refers to a trainee's ability to recall facts and

principles taught in training, in addition to the relationship among these facts and principles (Kraiger, Ford, & Salas, 1993). Procedural knowledge is related to information about how to perform a task or action, and involves the application of declarative knowledge in order to carry out a certain procedure (Kraiger et al., 1993). Although, web-based instruction has been deemed effective (and, sometimes superior) in teaching declarative knowledge, classroom instruction has been found to be more effective in teaching procedural knowledge than web-based instruction. This suggests that, although trainees are able to sufficiently gain knowledge in the form of facts and principles taught through web-based instruction, the application of this knowledge may require in-person, or traditional didactic training. The best outcomes for knowledge acquisition in the areas of both declarative knowledge and procedural knowledge occur when web-based instruction was used as a supplement to classroom instruction. Furthermore, there are specific instructional strategies used in web-based instruction that further contribute to increased knowledge acquisition. These instructional techniques include, practicing of the presented concepts in a variety of ways, receiving immediate feedback regarding performance, and having a sufficient length of training across instructional formats.

There are several advantages to web-based instruction that may contribute to a trainee's selection and preference for web-based instruction. Specifically, non-traditional students who may have work, family, and community commitments may find web-based instruction a more convenient method of accessing education (Buerck et al., 2003). The amount of time spent in training may also be reduced because instruction is delivered in a more efficient manner. Oftentimes, web-based instruction requires less time than traditional instruction, and learning outcomes are similar across instructional formats (Cook, Dupras, Thompson, & Pankratz, 2005). Additionally, trainees may be more readily prepared to begin applying the knowledge acquired

through web-based instruction. Web-based instruction allows for a reduction of information overload. For example, the content can be self-paced and divided into modules to reduce information overload. By presenting the learner with smaller chunks of information, the material is disseminated over several sessions (Goldstein & Ford, 2002; Welsh, Wanberg, Brown, & Simmering, 2003), which is consistent with research regarding adult learning (Montague & Knirk 1993).

Despite support for the use of web-based instruction, critics have suggested weaknesses of the existing studies that have explored the use of media-based instruction (e.g., computers, video conferencing, and the internet; Bernard et al., 2004; Clark, 1983; Clark, 1994; Russell, 1999). Specifically, weaknesses of research exploring media-delivered instruction have included methodological flaws in the research design of studies that have compared web-based instruction to classroom instruction, such as lack of random assignment, and a failure for studies to demonstrate the unique instructional features of web-based instructional methods. An additional limitation in the existing web-based instruction literature is the limited number of empirical studies regarding the use of web-based instruction to teach procedural knowledge. In the few studies the few published studies, web-based instruction has not been as effective in teaching procedural knowledge as traditional classroom instruction (Sitzmann et al., 2006). Therefore, in applied professions, trainers should be vigilant to measure the application of procedural knowledge taught through web-based instruction, which is consistent with the current stance that, web-based instruction and classroom instruction should be combined with in vivo training when teaching procedural knowledge (Sitzmann et al., 2006; U.S. Department of Education, 2009). Although increased declarative knowledge is not alone sufficient in skill development and does not equate mastery of a give skill, it is worth noting that increased declarative knowledge, does

in fact contribute to increased procedural knowledge by providing learners with a knowledge base prior to learning a new skills (Rittle-Johnson, Star, & Durkin, 2009).

Due to the limited amount of research and mixed findings regarding the efficacy of web-based instruction, there is a call for additional research in this area. Specifically, because web-based instruction has demonstrated overall success as a method of increasing declarative knowledge, the use of web-based instruction should be explored with diverse populations including individuals who have not traditionally been seeking professional training. Currently, most research on web-based instruction has been conducted with institutions of higher education (e.g., distance education programs offered through universities). However, it would be important to extend this research outside of the world of academia, and explore the use of web-based instruction to increase the knowledge of individuals who would benefit from skill training that could be delivered through web-based instruction (e.g., parents of children with ASD who are seeking training on behavior modification).

Noting the aforementioned strengths and weaknesses of web-based instruction as compared to classroom instruction, several considerations should be made in selecting the format of training that will best facilitate learning. For example, participants' perceptions of the type of training received should be considered. The instructional preferences of the learner is worth assessing because web-based instruction has been more effective for trainees who self-select web-based instruction as their method of training (Sitzmann et al., 2006). Trainers and educators should, therefore, consider that some individuals may benefit from web-based instruction more than others. Trainees should not be forced into completing online training, as this may result in failure of mastering the course material.

Additional personal characteristics such as trainee instructional preferences and age of trainees may need to be considered when advocating for the use of web-based instruction (Sitzmann et al., 2006). Individuals with higher motivation, cognitive abilities, and competence in the use of technology tend to self-select online instructional programs and experience better outcomes than when trainees are randomly assigned to web-based instruction programs. Age of trainees is also relevant in determining the method of instruction, and effectiveness of web-based instruction has reportedly increased with age. Specifically, older participants (ages 23-45; mean age 34) display higher levels of knowledge acquisition through web-based instruction, while younger participants (ages 12-22; mean age 19) tended to be more successful within structured classroom environments (Graham, 1991; Sitzmann, 2006). This has been explained by differences in autonomy motivation, and anxiety among younger and older trainees. Older, nontraditional students have more positivity and decreased academic anxiety towards their training (Graham, 1991) and tend to be more focused on achieving specific learning outcomes, as compared to younger, traditional students (Tallent-Runnels et al., 2006).

Web-Based Instruction in ABA

The use of web-based instruction has become increasingly popular in providing training in ABA (e.g., Granpeesheh, et al., 2010; Hamad, et al., 2010; Jang et al., 2012). Given the support for the use of web-based instruction in increasing declarative knowledge (Sitzmann et al., 2006), in addition to the shortage of trained professionals to meet the needs of children who would benefit from ABA therapy (Granpeesheh, et al., 2010) it may be especially important to consider the use of web-based instruction as a component of training. In order to circumvent the shortage of trained professionals, web-based instruction in ABA has been one way to disseminate training to a greater number of individuals, especially those who do not have access

to traditional in vivo training. Examples of individuals who would likely benefit from web-based instructional programs include geographically disparate individuals who do not have access to conventional training, including professionals working with the ASD population, as well as parents and family members of children with ASD (Hamad et al., 2010).

A small body of research has been published specifically on the utility and effectiveness of web-based instruction as a method of providing training in ABA. For example, web-based instruction programs in ABA have been evaluated by comparing web-based instruction (also referred to as “e-learning”) to traditional in-person training in a group of newly hired ABA therapists (Granpeesheh et al., 2010). Web-based instruction programs have provided instruction in basic components integral to the understanding and implementation of ABA. Specific topics addressed within these web-based instruction programs included autism, introduction to ABA, discrete trial training, behavioral contingencies, antecedent and consequence interventions, functions of behaviors, shaping, chaining, pairing and teaching cooperation, prompting/fading (Granpeesheh et al., 2010; Hamad et al., 2010). Many of these training programs include [PowerPoint](#) presentations, embedded video clips demonstrating the presented concepts, note-taking options. Some web-based programs also segment the information into modules (Hamad et al., 2010), which allows trainees to pace themselves and reduce information overload (Sitzmann, et al. 2006).

Outcomes of research regarding web-based programs in ABA are difficult to interpret due to significant methodological flaws. For example, differences in performance have been reported between subjects trained through a web-based instructional program in ABA, and subjects training through a traditional, in vivo ABA training program (Hamad et al., 2010). However, both groups displayed sufficient levels of knowledge acquisition in the content

presented during training (Granpeesheh et al., 2010) and participants who received traditional, in vivo training received a substantially greater number of training hours as compared to those who received web-based instruction.

Web-Based Instruction for Parents of Children with ASD

Web-based instruction in ABA has also been used to train family members of children with ASD. Expanding on those studies that examined the use of web-based instruction with newly hired ABA therapists (e.g., Granpeesheh et al., 2010), similar web-based instructional programs have been used to train family members of children with ASD (Jang et al., 2012).

Family members reported several advantages of web-based instruction, such as improved access to training in ABA that was not previously available to family members due to geographical restrictions and satisfaction with the convenience of web-based instruction. For active parents who may be maintaining jobs outside the home, caring for other family members, or have limited availability to receive in-person training, having the freedom to complete the training at their own pace was a distinct advantage. The option for learners to space-out the modules allows for shorter, more manageable, amounts of time for exposure to instructional content. The use of modules to pace instruction allows for increased accessibility to training, based on the availability of the learner.

Another advantage of web-based instruction for parents of children with ASD is the potential for cost effectiveness in getting access to training (Jang et al., 2012). Reductions in cost for trainees may occur through decreased the cost of travel, as well as the cost associated with in-person training from a professional clinician. Although there are inherent costs of web-based instruction, such as computer, internet, and program costs, the costs are dramatically less than those associated with having an in-person expert provide training in which third party

funding may not be available for lower-income families. Additionally, given the large percentage of families within the United States that have access to computers (77% of households as reported through 2010 U.S. Census Bureau's Current Population Survey [CPS]) and internet (64% of households as reported through 2010 CPS (U.S. Department of Commerce, 2011), web-based instruction may be a reasonable and accessible option for many families.

Additional research has focused on methods of web-based instruction and outcomes for functioning of children with special needs. (Pacifici, Delaney, White, Nelson, & Cummings, 2006; Parette, Meadan, Doubett, & Hess, 2010; Wade, Wolfe, Brown, & Pestian, 2005). For example, web-based instruction programs developed to provide foster, adoptive, and kinship parents with information regarding and the etiology of their child's condition through web-based instruction increased parental knowledge, satisfaction, and implementation fidelity (Pacifici et al., 2012). Similarly, the use of a web-based intervention program for parents of children affected by traumatic brain injuries resulted in significant reductions in parental burdens and distress, in addition to positive child outcomes (i.e., decreased problem behaviors) following an online family intervention program (Wade et al., 2005). The reductions in problem behaviors were partially explained through increases in parents' knowledge of techniques for problem-solving and managing their child's problem behaviors (including antecedent interventions), which resulted from participation in web-based instruction.

Considering parental preferences is important in the development and utilization of web-based instruction for parents. The experience of raising a child disabilities may result in unique challenges to parents, including elevated stress and difficulty accessing appropriate treatments (Dorenberg & Baker, 1993; Minnes, 1988). It is, therefore, imperative to develop web-based instruction programs that are consistent with parents' needs and yield positive outcomes. Parents

of children with disabilities who participate in web-based instruction have reported satisfaction and convenience with the following training components: the ability to utilize “key word” features for the website, access to searchable databases, having the website organized according to specific disabilities, access to resources related to the child and/or family’s interests (Parette et al. 2010). Web-based programs that integrate parent preferences (Parette et al., 2010), as well as components of training that are described in the adult learning literature, such as segmenting the information according to topic, opportunities for practice and assessment, and frequent feedback (Montague & Knirk, 1993), are critical factors to be included when developing a web-based training program that can be used with parents of children with disabilities.

Despite the existing support for the use of web-based instruction, specifically in the area of ABA, web-based instruction should not, alone, be considered a sufficient method of training individuals to implement behavioral interventions with a high degree of fidelity; this is due to the lack of research regarding treatment fidelity following participation in web-based instruction. Additionally, access to web-based instruction does not replace the need for in-person training and coaching, but likely reduces the amount of time that trainees require face-to-face supervision. The need for a combination of web-based based training in ABA, as well as in-person instruction and supervision is consistent with the research regarding the general effectiveness of web-based instruction. This research has suggested that, although web-based instruction is sufficient in increasing declarative knowledge on a given topic, in-person instruction is necessary in order for this declarative knowledge to translate to procedural knowledge (Sitzmann et al., 2006), or, in this case, ABA implementation. Further, the current literature examining the use of web-based instruction with parents of children with ASD is

limited, and therefore, additional research is needed in order to first determine whether web-based instruction with this population produces similar gains in declarative knowledge.

Summary

Parents of children with ASD have demonstrated increased levels of stress associated with raising a child with special needs (Koegel, et al. 1996) and obtaining efficacious treatments and educational practices for their child (Lake & Billingsley, 2000; Stoner et al., 2005). During the process of educational planning, parents may be disempowered in the presence of professionals, who use jargon with which the parents are unfamiliar and that may overshadow the parents' voices and opinions (Turnbull & Ruef, 1997). Given the legal obligation for school personnel to involve parents in special education planning, methods for increasing parental empowerment during the development of an IEP should be explored. Parents who have been trained in evidence-based treatments have demonstrated success in implementing these interventions with their children (Hawkins, Peterson, Schweid, & Bijou, 1966; Wahler, 1969; Zeilberger, Sampen, & Sloan, 1968). Furthermore, web-based training programs have been effective in increasing declarative knowledge in adult learners (Sitzmann et al., 2006). Because many parents may not have access, time, or resources to receive traditional training, web-based training in behavioral interventions may be a more parent-friendly method of accessing training programs (Jang et al., 2012). Should parents of children with ASD demonstrate satisfactory gains in their declarative knowledge through web-based instruction, it would then be appropriate to explore methods of increasing parents' procedural knowledge of evidence-based behavioral interventions. The current study serves as a "first step" in expanding the literature surrounding web-based training with parents of children with ASD by exploring four areas, including 1) web-based instruction as a method of increasing parental knowledge of behavioral interventions, 2)

increased empowerment in educational planning in parents of children with ASD who participate in web-based instruction, 3) increased ability to request evidence-based treatments in parents of children with ASD who participate in web-based instruction, and 4) parental satisfaction with web-based instruction in behavioral interventions.

Chapter III

Research Methodology

This chapter includes a description of the participants in the study, procedures used to collect data, and instruments used. Statistical methods used to analyze the data also are detailed in this section.

Parents were asked to participate in an empirical study examining knowledge acquisition, parental empowerment to request evidence-based treatments in their child's educational planning, and satisfaction with the ATS training program for parents.

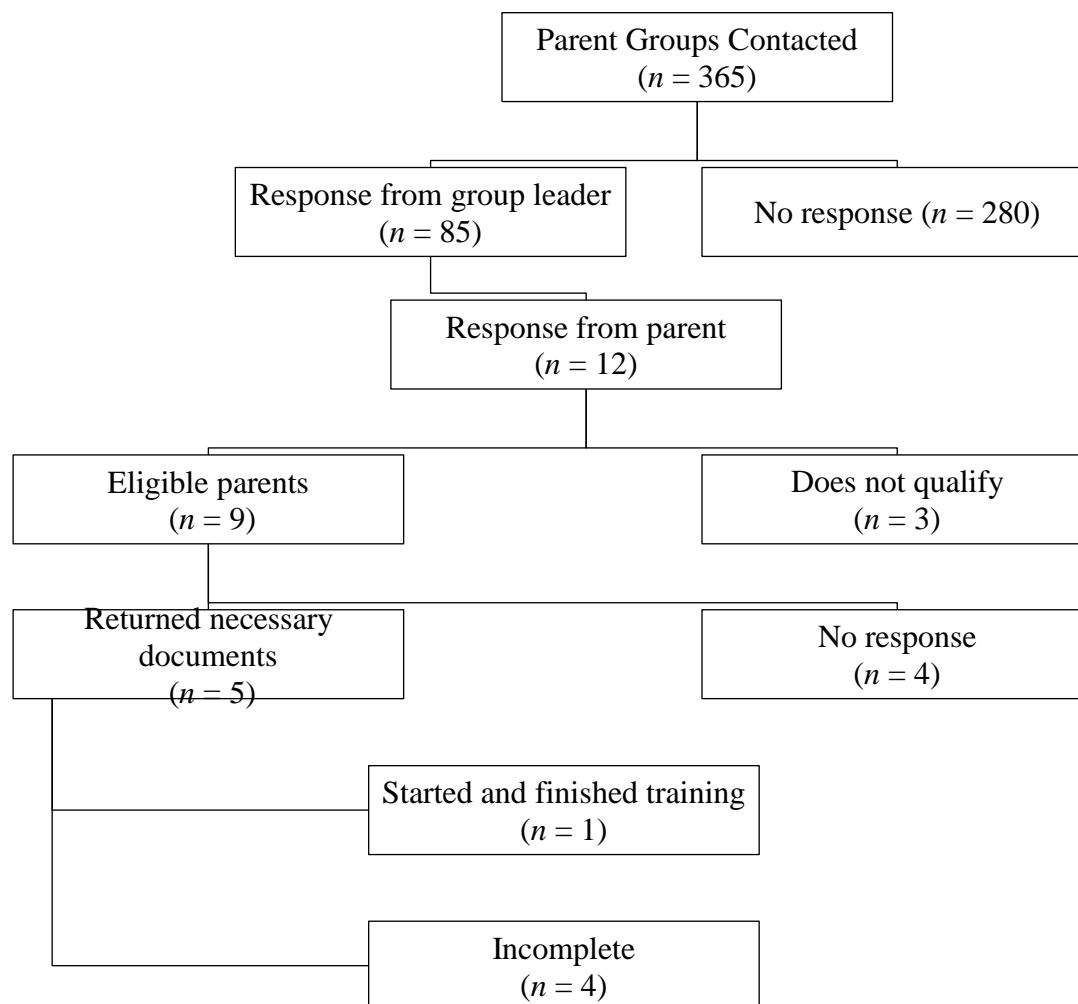
Participants

Recruitment for the current study included two phases. The first phase took place across five months and led to low enrollment levels. As a result, the researchers expanded the geographical recruitment of participants and also partnered with a large, nationally-recognized autism treatment and research center to recruit participants. Recruitment procedures are described below.

Recruitment phase one. The first phase intended to use web-based advertisements to recruit parents of children with ASD living in the Midwest. Recruitment was limited to parents living in Midwestern states (i.e., Indiana, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin) in phase one due to regional differences in the number of trained professionals available in this region. Specifically, Midwestern states tend to have fewer certified BCBAs and therefore, parents residing in midwestern states may have more difficulty accessing treatment and training. In order to recruit parents of children with ASD living in the Midwest, the lead investigator generated a list of organizations and support groups for parents of children with autism and developmental

disabilities in midwestern states. This list was developed by first visiting national autism advocacy organizations, including Autism Speaks and Autism Society of America. These organizations publish parent resources on their websites, which include lists of local parent organizations, categorized by state. After generating a list of 365 parent groups in midwestern states, the researchers contacted the parent groups' leader (or listed contact person) to explain the purpose of the study and to ask that the leaders share the recruitment flyer with their group members. The researchers also asked permission to post the flyer on the groups' social media site (e.g., Facebook). If the researchers received no response after initially contacting each of the parent groups, the researchers sent a maximum of two follow-up emails before discontinuing contact and removing the parent group from the list of potential recruitment sites. Participant responses during phase one of recruitment are depicted in Figure 3.1.

Figure 3.1

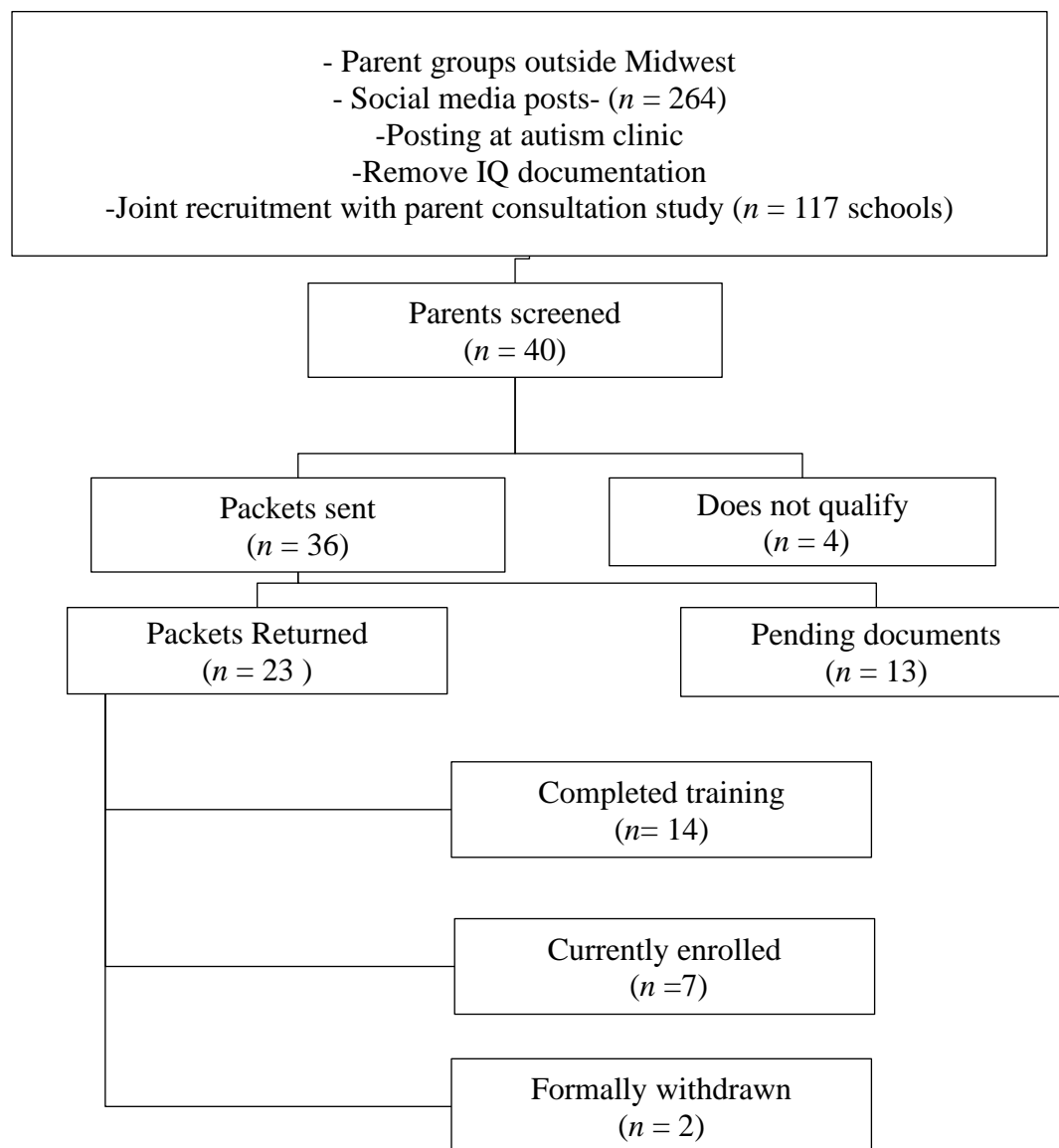
Recruitment procedures: Phase one

Recruitment phase two. Due to low enrollment following phase one, alternate recruitment procedures were used to identify potential participants. First, the requirement of submitting records of IQ scores was removed from the inclusion criteria. Additionally, a list of social media groups for parents living outside of the Midwest was generated by entering the terms “Parents” and “Autism Spectrum Disorder” into the social media search bar. Recruitment flyers were then posted directly to the public forum on each groups’ site.

Phase two of recruitment also occurred in conjunction with that of another web-based parent training project that involved the option of web-based consultation (in addition to web-based training through ATS). The recruitment flyer included descriptions for both of the parent training projects and an e-mail address was listed on the recruitment flyer for interested participants to contact. Recruitment flyers were disseminated by the researchers to 117 special education directors at [midwestern](#) public schools to be shared with eligible parents within the district. Parents then sent an e-mail to the listed contact and indicated interest in one of the two parent training projects. If parents did not express a preference for one of the two studies, the researchers randomly assigned them to one of the two parent-training studies. Once assigned to one of the studies, the researchers conducted a phone screening with prospective participants to determine whether they qualified for the study based on inclusion/exclusion criteria.

Additionally, during phase two, recruitment flyers were disseminated by a large, nationally-recognized clinical and research institution specializing in ASD located in the Southeast. Although participants recruited through this site resided outside of the Midwest, which was the initial population of interest, the state from which participants were recruited in phase two also was reported to have similar limitations in concentration of BACB certificants per-capita according to the U.S. Census (April, 2010). In phase two, recruitment flyers were disseminated to families who met criteria for the current study and had previously consented to being contacted for research opportunities available through the clinic. The recruitment flyer was also shared as part of the clinic's general advertisements, which included posting paper copies through the clinic and disseminating flyers to families during diagnostic assessment feedback sessions. Participant responses during phase two of recruitment is depicted in Figure 3.2.

Table 3.2

Recruitment procedures: Phase two

Enrollment. Potential participants who expressed interest in the study were contacted by phone to conduct a pre-screening interview, during which the researcher provided the parent with a more detailed description of the study and asked relevant demographic information to determine if the parent was eligible to enroll in the study. Questions included in the screening

interview included age and diagnosis of child, previous parent training experience, co-morbid medical/psychological diagnoses of the child, and custody status of the child (i.e., only parents who had legal custody/guardianship of the child were eligible to participate).

Following the phoning screening, eligible participants were asked to provide documentation from a psychologist or physician to confirm their child's diagnosis of an autism spectrum disorder (ASD) prior to inclusion in the study. Psychological or medical reports indicating that the child has a previous diagnosis of autistic disorder, Asperger's disorder, or pervasive developmental disorder, not otherwise specified (according to DSM-IV criteria) were considered to be acceptable documentation for a confirmed diagnosis. Because parental empowerment within the school setting is of specific interest in the current study, only parents of school-aged children (ages 6-12) who were enrolled in school at the time of the study were eligible. Parents of children who attended full-time ABA clinics (instead of attending traditional school) and children who were homeschooled were not included in the study.

After receiving all necessary documentation from parents enrolled in the study (i.e., signed informed consent, medical documentation confirming an ASD diagnosis) additional screening procedures were employed. Specifically, participants completed an online demographic questionnaire which assessed the following areas: child's primary disability, age of child, gender of child, gender of parent, age of ASD diagnosis, and primary language spoken in the home. Participant demographic information was deemed useful in the case that the current methodology is replicated with more diverse parent populations (e.g., with more geographically and economically diverse populations). In addition to the online demographic questionnaire parents in both treatment conditions also completed the first pre-test of knowledge acquisition in ABA strategies (i.e., Principles of Reinforcement) during the screening process. Only parents who

scored below 75% (1.5 standard deviations beyond the average pre-test score on this module, as reported through existing ATS parent data) were included in the study. This criterion was established to control for the effects of previous knowledge and training in ABA and to decrease the chances of a restricted range when assessing changes in knowledge acquisition following the ATS training program.

Sample. A total of 19 parents enrolled in the study. There were five participants who enrolled in the study and were provided with training schedules but dropped out. In most cases, a rationale for discontinuation of the study was not provided and participants did not respond to follow-up contact from the researchers. Two parents reported that they did not have time to complete the training. The final sample included 14 participants who completed the study based on their group assignment (i.e., treatment group or wait-list control group).

Demographic information was taken from pre-enrollment phone screening responses as well as a demographic questionnaire that was completed online. All participants were female ($n = 14$). Parent participants reported their child's age to range from 6 to 12 years. Most participants had a child diagnosed with autism spectrum disorder ($n = 10$); the remaining were diagnosed with Asperger's Syndrome ($n = 1$) and PDD-NOS ($n = 3$), under previous DSM-IV diagnostic criteria.

All participants reported English to be the primary language spoken in the home. Parents age was reported to fall within the range of 22 to 49. Annual household income was reported to range from less than \$25,000 to above \$200,000. The majority of participant resided in midwestern states ($n = 9$); five participants lived in states outside the Midwest (i.e., Georgia, California, and Massachusetts).

Research Procedure

After participants completed screening procedures and all necessary documentation was received by the researchers, participants were emailed (via password-protected Word document) a schedule outline for the training period. The training schedule included hyperlinks to all the online questionnaires and training modules and a proposed timeline for completion. At the beginning of the 5-week training period (and prior to beginning the ATS training modules), parents in the treatment and control groups were administered a battery of pre-training assessments including the demographic questionnaire, a measurement assessing pre-existing knowledge of ABA, and a self-report assessment measuring parental empowerment regarding their child's educational planning. Parents were also given a list of commonly used autism treatments (ranging from those that have been considered established treatments, and those considered to be unestablished treatments). Participants in both groups were first asked to identify which of the treatments were evidence-based. Then participants in the treatment group were asked to select treatments that they have requested during their child's previous IEP meetings. After completing the pre-training assessment, participants in the treatment group was provided with access to ATS and encouraged to complete the training within 5-weeks of starting the program. The lead investigator provided participants with a suggested schedule for completing the training within 5-week period and sent weekly e-mails that encouraged progress toward timely completion of training. The lead investigator was able monitor the progress of the participants on ATS, and participants who failed to demonstrate progress towards timely completion according to the schedule were sent an individualized email to prompt the participant to complete the modules according to the schedule. For participants assigned to the control condition, pre-test assessments were open during the first half of the five-week training period,

and post-test assessments were made available for completion during the second half of the training period. Participants in the control condition were also provided with individualized email prompts when they fell behind in completing the pre- and post-assessments.

All participants assigned to the treatment condition completed selected ATS modules including the following topics: Principles of Behavior (Reinforcement and Behavior Reduction), Instructional Control, and Teaching Verbal Behavior. During the treatment phase, knowledge acquisition was assessed through multiple-choice assessments prior to beginning each module, and again upon completion of all lessons within each module. Participants assigned to the control condition took the pre- and post- multiple-choice assessments within a five-week training period.

After completing the training, participants (in both treatment and control conditions) completed the battery of post-training assessments, including the measure of parental empowerment (the *Family Empowerment Scale*—Service System subscale) and a training satisfaction questionnaire. The satisfaction questionnaire was only administered to participants assigned to the treatment condition. At the time of the post-assessment, all participants were again provided with a list of commonly used treatments for individuals with autism (including established and unestablished treatments) and were asked to identify those treatments that were evidence-based in treating symptoms of ASD. In a separate question, participants were also asked to select those interventions that they planned to request during their next IEP meeting. Those participants assigned to the wait-list control group were given access to the ATS training program at the conclusion of the five-week enrollment window.

Treatment

Parent training. Participants were provided with access to the ATS web-based training on behavior management including: Principles of Behavior (Reinforcement and Behavior

Reduction), Instructional Control, and Teaching Verbal Behaviors (Table 3.1). Within each module a series of concepts were presented through videos that include textual and verbal descriptions of the content covered with the section; case examples often were included in the videos to provide the participant with an illustration of the presented concepts. A summary of topics addressed with each module appears in the following table:

Table 3.1

Description of ATS Modules

Module	Objectives
Principles of Behavior: Reinforcement	Understand the definition of behavior Identify the ABCs of behaviors Identify the origins of the principles of ABA Identify and give examples of positive and negative reinforcement and punishment
Principles of Behavior: Behavior Reduction	Identify the principles of reinforcer effectiveness in given scenarios Identify and discriminate between different schedules of reinforcement Identify and define extinction
Instructional Control	Understand the characteristics of motivation and reinforcement
Teaching Request/Mands	Understand basic verbal operants

The participants were also provided with space for text, should they wish to take notes during the videos. At the conclusion of each video, the participants provided with competency checks (i.e., 1-2 multiple choice questions) to ensure sufficient understanding of the presented

topic. Participants were provided with standardized feedback based on their responses, and the multiple-choice questions must have been answered correctly before moving to subsequent videos and taking the module's final post-test. Once the participant had watched all the videos and successfully completed all competency checks within the module, the module's post-test was be made available.

Instrumentation

Knowledge acquisition. Prior to beginning each of the modules, participants completed a pre-test that assessed their pre-existing knowledge of the concepts presented within each module in a multiple-choice format. Each test measured the participants' knowledge of concepts related to behavioral interventions (i.e., reinforcement, behavioral reduction, instructional control, and verbal behavior). Each test included 15-20 items related to the information that was presented within each module. Upon completion of each of the modules, participants completed the matching post-test. Pre- and post-training scores of knowledge acquisition were derived from the percentage of items the participant answered correctly. A score of 80% accuracy during the post-test indicated mastery of the content within the given module.

Parental empowerment. Parental level of empowerment in educational planning (before and after participating in the training program) was assessed through the Family Empowerment Scale (FES; Koren, DeChillo, & Friesen, 1992). The FES measures family empowerment across several systems including the family system, the service system, and the community system; three separate subscales within the FES are derived from the examination of each of these systems. The family system refers to the day-to-day situations within the home; the service system includes individuals and agencies who provide services to the parent's child; the community political system encompasses community services and local and federal legislative

systems that influences services provided to the child. Although the FES measures parental empowerment across several contexts, the current study only included items from the service system subscale. The service system subscale was selected in order to efficiently utilize the amount of time that participants spend completing pre/post assessments. Because the current study aims to provide web-based instruction as a method of decreasing the overall time parents spend in training, and to make the training process less taxing for the parents, the service subscale was selected due to the items' relevancy to the research questions regarding increases in parental empowerment following participation in web-based training.

The service system subscale of FES consists of 12 questions with responses ranging from (1) never, (2) seldom, (3) sometimes, (4) often, (5) very often. Scoring for the FES is done by calculating the mean for the subscale; higher scores indicate increased feelings of empowerment. Previous research reported reliability coefficients for the FES service system subscale was reported to be .87, with sufficient convergent and discriminate validity (Koren, DeChillo, & Friesen, 1992; Akey, Marquis, & Ross, 2000).

Parent satisfaction with training. Parents reported their level of satisfaction with the training experience through a self-report assessment. The satisfaction assessment was developed by ATS, used with previous ATS users, and modified by the researchers for the current study. The measure included items related to technical issues while using the web-based training (e.g., technical difficulties with videos, competency checks, notes, quizzes, registration, and use of technical support), reports of overall ATS training experience (e.g., time spent per session), reports of satisfaction with knowledge acquisition during the training program (e.g., increased confidence in ABA principles and application of acquired knowledge in daily life), satisfaction with content areas of the training, and the likelihood of recommending ATS training to others.

Questions included in the satisfaction questionnaire included 5-point Likert items (i.e., Not True at all, Mostly not True, Somewhat True, Mostly True, Very True). Specific items were selected by the researcher in order to obtain an overall satisfaction score and to gauge parents overall level of satisfaction with the training. The measure also includes several open-ended questions, used as a means of allowing participants to expand upon their responses during the close-ended questions. Responses to the open-ended questions were examined qualitatively.

Identifying and Requesting EBT. Participants completed a web-based questionnaire before and after completing web-based training. The instrument was designed to meet the dual purpose of identifying treatments that parents' have previously requested that the school provide for their child during IEP meetings, as well as their ability to identify evidence-based treatments following their participation in ATS. To measure parents skill in identifying and requesting evidence-based treatments, participants were presented with a list of commonly used autism treatments (ranging from treatments that are evidence-based to those with less empirical support). This measure was used to gauge the parents' ability to advocate for evidence-based interventions within their child's school environment.

Scores for each of these items were calculated by assigning positive and negative values to each of the listed treatments. All established treatments (i.e., differential reinforcement; functional communication training) were assigned a score of one. All unestablished treatments (e.g., weighted vests; gluten- and casein-free diet) were assigned a score of negative one. A summed total was then calculated and used as the outcome variable. Therefore, when asked to identify six evidence-based treatments, the highest possible score was six, and the lowest possible score was negative six. When asked to identify treatments previously requested or

treatments intended to be requested from a list of 22 treatments, the highest possible score was eleven.

Data Analyses

Within and between group changes in knowledge acquisition and parental empowerment were assessed through a pre- and post- test design. Specifically, a series of repeated measures ANOVAs were used to measure changes for each of the outcome variables, including knowledge acquisition, parental empowerment, and educational practices. Access to training and time of completion served as the independent variables. The results of the ANOVAs were used to indicate any changes in dependent variables, which was determined to be useful in identifying the effects of participation in web-based training on knowledge of behavioral interventions, parental empowerment with regard to educational planning, and educational practices implemented with the child's school. Level of parent satisfaction was examined descriptively.

Chapter IV

Results

This chapter reports the results of the current study using several web-based assessments, including pre- and post- assessments of content presented in ATS training modules, the Family Empowerment Scale (Koren, DeChillo, & Friesen, 1993), ratings of evidence-based versus unsupported treatments, and a satisfaction questionnaire. Results for each measure are presented separately and descriptive statistics for all measures are reported. Results of the repeated measures ANOVAS are also reported, including measures of effect size for significant change scores. Participants in the treatment condition completed a satisfaction questionnaire; results are reported descriptively.

Research Question 1

Do parents of children with ASD who participate in web-based training in the area of behavioral interventions demonstrate increased knowledge of behavioral interventions as compared to parents who do not receive behavioral intervention training?

Descriptive statistics. Changes in parental knowledge of behavioral interventions were computed based on average performance on the pre- and post- ATS content assessments. All four ATS module assessments included a total of 55 items. There was one participant in the control condition who only completed three of the four post-assessments. The participant's data are included in the analyses but the percentage of items answered correctly was adjusted based on the three post-assessments that were completed by the participant (i.e., 36 items).

Means, standard deviations, ranges, and 95% confidence interval for total score on the ATS content assessments were calculated for each participant and are presented in table 4.1. Means for both the treatment and waitlist control group at the time of the pre-test ranged from 48.29% to 51.69%. ATS considers mastery criteria to be 80% accuracy, so both groups were

reported to have failing scores during the pre-test. At the time of the post-test, the mean score for the treatment group was 92.46% correct, which demonstrates mastery of the content, as determined by ATS criteria. The mean performance for the waitlist control group at the time of the post-test was 50.25% correct, which remained in the failing range. Statistically significant changes within and between groups are discussed below.

Table 4.1

Descriptive Statistics for Total Score on ATS Knowledge of Behavioral Interventions

		<i>n</i>	Minimum	Maximum	Mean	SD	95% Confidence interval
ATS Pre-Test	Treatment	7	40	62	51.69	8.05	44.24 – 59.14
	Waitlist Control	7	31	65	48.29	12.27	36.95 – 59.64
ATS Post-Test	Treatment	7	84	96	92.46	4.37	88.42 – 96.50
	Waitlist Control	7	32	70	50.34	12.78	38.52 – 62.17

Table 4.2

Repeated Measures ANOVAs for Knowledge of Behavioral Interventions

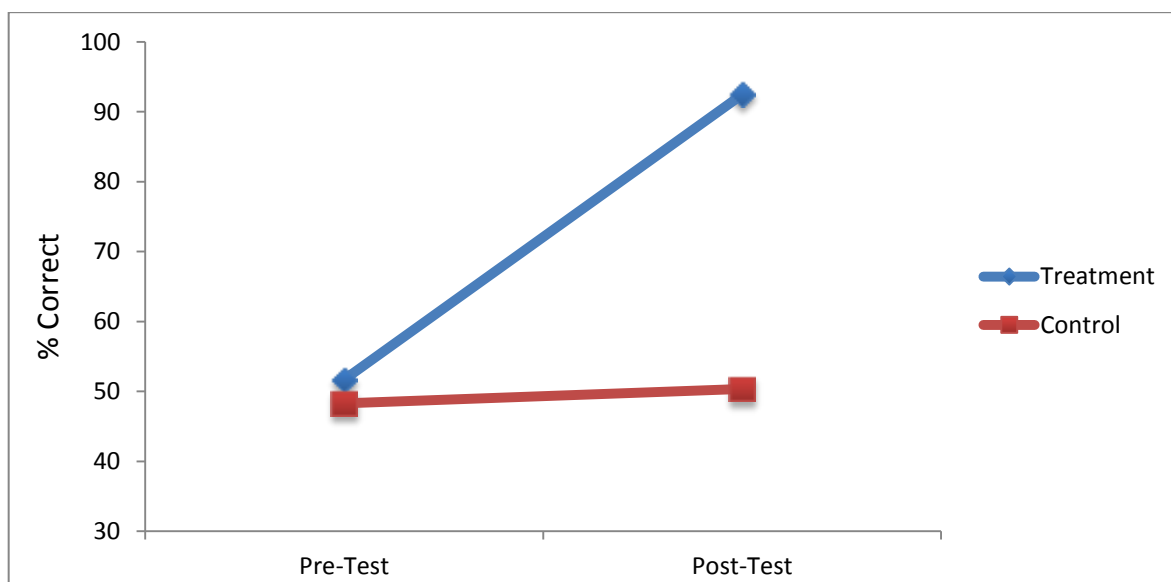
	<i>df</i>	<i>F</i>	<i>p</i>	Partial η^2
Within Group Effects				
Time (Pre/Post)	13	53.03	< 0.001	0.82
Time x Treatment	13	43.35	< 0.001	0.78
Between Group Effect				
Group	1	26.18	< 0.001	0.69

Repeated measures ANOVA results. A repeated measures ANOVA was conducted to determine if there was a significant change in ATS knowledge scores over time. Additionally, this analysis reported differences by treatment condition, and an interaction between treatment

and time, which would examine change over time for both groups. The alpha level was set at 0.05. Results of the repeated measures ANOVA indicated there a significant main effect between treatment groups ($F = 26.18$; $p < 0.001$). There were also significant within group changes based on the time of the administration (i.e., pre- versus post-) ($F = 53.03$ $p < 0.001$), as well as the interaction between time and treatment condition ($F = 26.18$, $p < 0.001$). The significant change within and between groups can be likely explained by the robust change in scores demonstrated by participants in the treatment condition when comparing pre- and post-assessment performance.

Figure 4.1

ATS Knowledge



Research Question 2

Do parents of children with autism who participate in web-based training in the area of behavioral interventions report increased empowerment in educational planning compared to parents who do not receive behavioral intervention training?

Descriptive Statistics. The Family Empowerment Scale (FES) was used to address the second research question regarding parental empowerment. The FES Service System subscale was administered as a pre- and post-assessment, which specifically assessed parents' reported level of empowerment in requesting services for the child. The FES Service System Subscale consistent of 12 questions with responses assessed on a 5-point Likert-type scale. Possible scores ranged from 12 to 60.

Means, standard deviations, ranges, and 95% confidence interval for total score on the ATS content assessments for each participant are reported in Table 4.3. Means scores for treatment and waitlist control group on the FES Service System subscale ranged from 40.00 to 40.14; post-test scores for both groups remained unchanged (as described below in the results of the repeated measures ANOVA). The mean scores at the time of the pre- and post-test suggested, on average, participants reported relatively high levels of empowerment in requesting services for their children (i.e., "Sometimes" to "Very Often") more often than reporting lower levels of empowerment (i.e., "Seldom" or "Never").

Table 4.3

Descriptive Statistics for Family Empowerment Scale

		<i>n</i>	Minimum	Maximum	Mean	SD	95% Confidence interval
FES Pre-Test	Treatment	7	26	50	40.00	7.90	31.70 – 47.30
	Waitlist Control	7	35	48	40.14	4.98	35.54 – 44.75
FES Post-Test	Treatment	7	32	49	41.57	6.85	35.23 – 47.91
	Waitlist Control	7	32	48	40.86	5.43	35.84 – 45.88

Table 4.4

Repeated Measures ANOVAs for Family Empowerment Scale

	<i>df</i>	<i>F</i>	<i>p</i>	Partial η^2
Within Group Effects				
Time (Pre/Post)	13	0.39	0.55	0.03
Time x Treatment	13	0.05	0.82	0.004
Between Group Effect				
Group	1	0.01	0.92	0.001

Repeated measures ANOVA results. A repeated measures ANOVA was conducted to first determine if there was any significant change in FES scores overtime, in addition to assessing the interaction between time and treatment. No significant main effect for time was reported, and there was no interaction between time of administration and group assignment. Additionally, no significant between groups effect was observed. In general, the results suggest that neither group displayed significant changes in their level of empowerment and access to treatment did not affect post-training outcomes on the FES. In general, both groups displayed relatively high levels of empowerment at the time of the pre-test, leaving little room for significant change between pre- and post-assessments.

Research Question 3

Do parents of children with autism who participate in web-based training in behavioral interventions demonstrate increases in their ability to request evidence-based treatments for their child within an educational setting as compared to parents who do not receive behavioral intervention training?

Descriptive statistics. To measure parental ability to request evidence-based treatments, parents were asked to 1) identify six treatments that were evidence-based (out of a list of 22

established and unestablished treatments) and 2) identify (at the time of the pre-test) interventions they have previously requested for their child, as well as interventions they plan to request for their child (asked at the time of post-test). This research question examined two separate dependent variables, including identification of evidence-based treatments and the ability to request evidence-based treatments.

Table 4.5 included the means, standard deviations, ranges and 95% confidence intervals. When asked to identify evidence-based treatments at the time of the pre-test, the treatment group and waitlist control group both demonstrated relatively weak skills in selecting evidence-based treatments over those with little empirical support. Mean pre-test scores for both groups ranged from 0.43 to 1.86. Differences between groups at the time of the pre-test were not statistically significant. At the time of the post-test, the treatment group demonstrated higher scores in identification of evidence-based treatments ($M = 4.43$), while the waitlist group control remained virtually unchanged ($M = 1.86$). Statistical significance of within and between group changes were assessed through a repeated measures ANOVA.

Descriptive statistics were also reported for parental ability to request evidence-based treatments; means, standard deviations, ranges, and 95% confidence intervals appear in Table 4.5. At the time of the pre-test, participants reported having requested relatively few evidence-based treatments (compared to those with limited scientific support), with mean scores for both groups ranging from -1.00 to 0.71. After completing the ATS training, the treatment group displayed increased intentions to request evidence-based treatments in future educational planning ($M = 2.71$). Participants in the waitlist control group, who did not have access to the ATS training at the time of the post-test, continued to display minimal intentions of requesting

evidence-based treatments in the future ($M = 0.57$). Analyses of between and within group changes are discussed below.

Table 4.5

Descriptive Statistics for Identification of EBT and Ability to Request EBT

		<i>n</i>	Minimum	Maximum	Mean	SD	95% Confidence interval
EBT Identification Pre-Test	Treatment	7	-4	5	0.43	3.16	-2.49 – 3.35
	Waitlist Control	7	-1	6	1.86	2.67	-0.61 – 4.33
EBT Identification Post-Test	Treatment	7	0	6	4.43	2.15	2.44 – 6.42
	Waitlist Control	7	-4	6	1.86	4.18	-2.01 – 5.72
EBT Request Pre-Test	Treatment	7	-4	1	-1.00	1.63	-2.51 – 0.51
	Waitlist Control	7	-2	5	0.71	2.50	-1.60 – 3.02
EBT Request Post-Test	Treatment	7	0	6	2.71	2.43	0.47 – 4.96
	Waitlist Control	7	-1	3	0.57	1.27	-0.61 – 1.75

Table 4.6

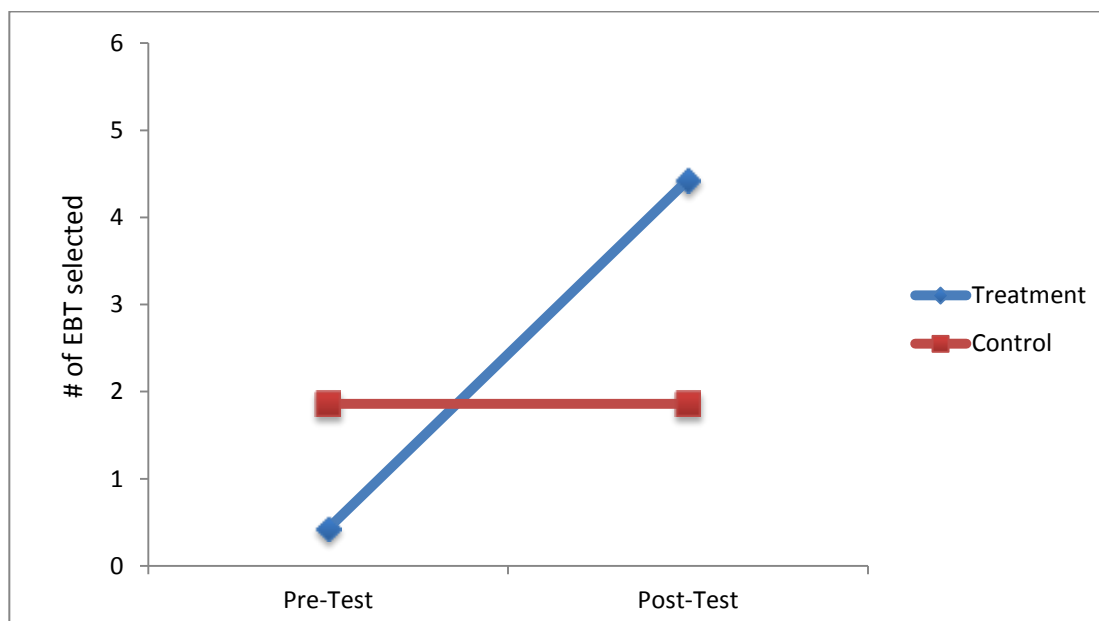
Repeated Measures ANOVAs for Knowledge of EBT and Ability to Request EBT

Identification of EBT	<i>df</i>	<i>F</i>	<i>p</i>	Partial η^2
Within Group Effects				
Time (Pre/Post)	13	4.00	0.07	0.25
Time x Treatment	13	4.00	0.07	0.25
Between Group Effect				
Group	1	0.18	0.68	0.02

Ability to Request EBT	<i>df</i>	<i>F</i>	<i>p</i>	Partial η^2
Within Group Effects				
Time (Pre/Post)	13	4.31	0.06	0.26
Time x Treatment	13	5.03	0.05	0.30
Between Group Effect				
Group	1	0.11	0.75	0.01

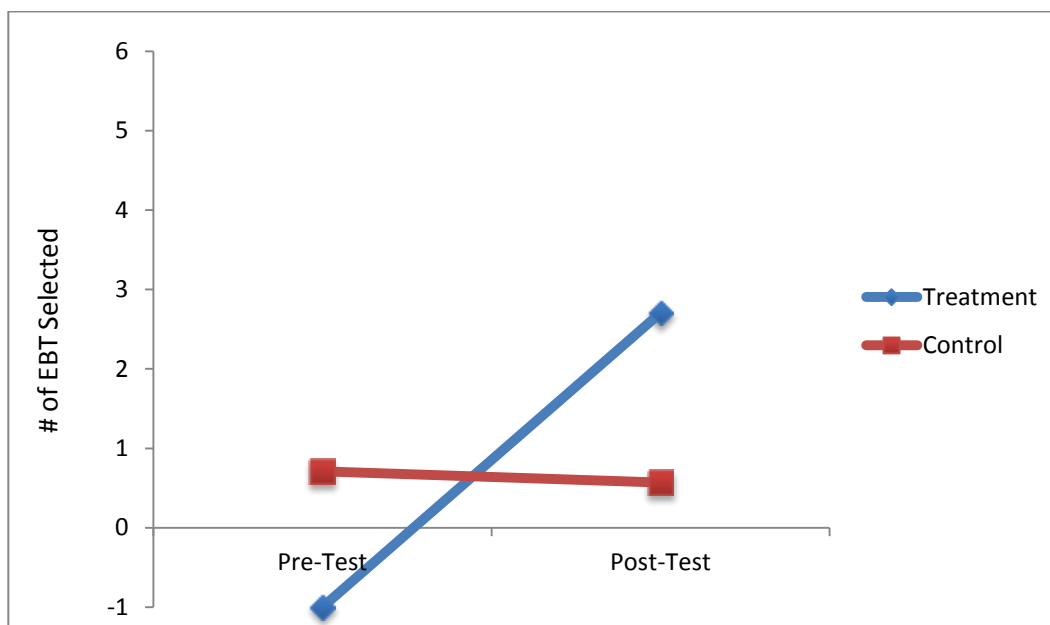
Repeated measures ANOVA results. Between and within group changes in identifying and requesting evidence-based treatments were assessed using a repeated-measures ANOVA. When examining the within group changes for identification of evidence-based treatments, the results suggest a main effect which is approaching but does not reach statistical significance ($p = 0.07$) for time (i.e., change from pre- to post-tests) or for the interaction effect between time and treatment condition. No significant main effect between groups was observed in parental identification of evidence-based treatments.

Figure 4.2

Identification of Evidence-Based Treatments

A repeated measures ANOVA was also employed to measure changes in parental ability to request evidence-based treatments during educational planning. Similar to knowledge of evidence-based treatment, the main effect for time was approaching significance ($p = 0.06$), while the interaction between time and treatment condition yielded a significant interaction effect ($p = 0.05$). Although the participants demonstrated a statistically significant within groups effect in the ability to request evidence-based treatments, a between-groups effect was not observed.

Figure 4.3

Ability to Request Evidence-Based Treatments**Research Question 4:**

Do parents of children with autism who participate in web-based training report satisfaction with their training experience?

Descriptive statistics. Participants assigned to the treatment group completed a satisfaction questionnaire upon completion of the training. Because there was no comparison group or pre-training assessment, reports of satisfaction with ATS training is reported descriptively in Table 4.7.

Table 4.7

Descriptive Statistics for ATS Satisfaction Questionnaire.

Satisfaction Question	Response	Frequency (<i>n</i> = 7)	Percent (<i>n</i> = 7)
<i>How effective was the ATS training in helping you understand the concepts presented?</i>	Extremely effective	3	42.9%
	Effective	3	42.9%
	Somewhat effective	1	14.3%
<i>What rating would you give your ability to apply and correctly implement the knowledge you gained in this coursework?</i>	Average	5	71.4%
	Advanced	2	28.6%
<i>What was the average amount of time you spent per session?</i>	45-60 minutes	5	35.7%
	More that 120 minutes	2	28.6%
<i>To what degree were you able to apply the information in the training to your daily life?</i>	A little	1	14.3%
	I used some concepts	2	28.6%
	Able to apply many	4	57.1%
<i>Would you recommend ATS to other parents of children with ASD?</i>	Yes	7	100%
	No	0	0%
<i>I am comfortable and have experience using technology</i>	A little	1	14.3%
	Yes	2	28.6%
	Very comfortable	4	57.1%
<i>Do you prefer web-based training over in-person training?</i>	Slightly prefer web-based	4	57.1%
	Slightly prefer in-person	2	28.6%
	Strongly prefer in-person training	1	14.3%

Overall, participants reported that the ATS training was generally effective in improving their knowledge. Six of the seven treatment group participants (85.8%) reported the training to be “effective” to “very effective;” one participant (14.3%) reported the training to be only “somewhat effective” in increasing understanding of the presented concepts.

The current study did not assess parental skill in implementing the strategies that were covered in the ATS modules, however, all participants believed their skill in implementing or applying the information ranged from “average” to “advanced.” No participants claimed to be an “expert” on the content within the training, but all reported they would be at least proficient in implementing intervention techniques following their participation in the ATS training.

Although participants reported they could implement the strategies presented in the training, not all parents reported the content to be largely relevant to their child. There was some variability in participants’ report of their ability to apply the information to their daily life. One parent (14.3%) reported that she was only able to apply the information to her daily life “a little.” In an open ended response question in which participants could report additional comments about their experience, one participant stated, “I found that most of the modules did not apply because my child has high functioning autism and I have only very specific concerns regarding communication/behavior.” Still, the majority of participants reported that they were able to apply the information right away, with some participants indicating they were able to apply “some of the concepts” (28.6%) and others reporting they were able to apply “many of the concepts” (57.1%). One participant reported, “x” Another participant reported changes in her own behavior after participating in the training on principles of reinforcement, stating that she may have previously been inadvertently “reinforcing a negative behavior” based on her response to her

child's problem behavior. All participants in the treatment condition reported they would recommend other parents/caregivers of children with ASD to participate in ATS training.

The final research question in the current study specifically examined whether parents could use web-based training as a feasible training format and whether they were satisfied with the training. One participant (14.3%) reported she was only "a little" comfortable using technology. All other participants reported feeling "comfortable" (28.6%) to "very comfortable" (57.1%) using technology. When asked if they preferred web-based training over in-person training, the responses were mixed, and most participants indicated a preference ("slight preference") for web-based training (57.1%), while others reported a preference ("slight" or "strong") for in-person training (42.9%).

Chapter V

Discussion

This chapter further reviews the results of the current study in addition to its relevance to past and future research in the web-based training for parents of children with ASD. The current chapter reviews the rationale of the study, as presented in Chapter I, and outcomes of the current study are discussed in relation to research questions presented in Chapter I. Implications of these findings to the field of parent training and parental empowerment for educational planning are also discussed. Finally, limitations to this study as well as recommendations for future research are presented.

Interpretation and Implications of Findings

The purpose of this study was to explore the functional utility of a web-based training program for parents of children with ASD. Although web-based training has been increasingly utilized to train parents of children with ASD (Granpeesheh et al., 2010; Hamad et al., 2010), no studies to date have examined how such training affects parental empowerment in advocating for evidence-based treatments in their child's IEP.

The first research question asked whether parents of children with ASD who participated in web-based training in the area of behavioral interventions demonstrated increased knowledge of behavioral interventions compared to those who did not receive behavioral intervention training. Parental knowledge of behavioral interventions represents the greatest measurable change among parents who participated in the study. Parents assigned to the treatment group demonstrated mastery over concepts presented in the training, indicating that presenting behavior analytic topics to parents in this format (e.g., web-based information tests, video examples, competency checks, and brief video lectures) successfully increased their knowledge of evidence-based treatments. Given the small sample size, this shows the treatment is robust

enough to result in significant increases in knowledge, as reflected by the 42-point differences between treatment and control groups. In addition, all participants reported the ATS training was, at a minimum, somewhat effective in increasing their knowledge of evidence-based treatments.

All participants reported they would recommend the ATS training to other parents of children with ASD. For some parents, in-person training may not be a convenient option for increasing knowledge about effective treatments. For example, families in rural areas with limited access to qualified professionals or parents who are unable to commit extended periods of time to travel to a training venue may find in-person training untenable. While using ATS, participants were able to start and stop the training modules at times that were convenient for them, with some participants completing several modules in one sitting, and other participants selecting to break the module into smaller chunks. This may make the scheduling of training more feasible for families whose calendars are already filled with school, therapy, and medical appointments. Other parents, however, prefer in-person to web-based training. Parents who experience difficulty finding the time and space to devote to web-based training within their own home due to the need to balance the many responsibilities of being a parent of a child with special needs may particularly benefit from in-person training. Parents who have access to childcare and are able to travel to an alternative training setting may prefer the opportunity to focus exclusively on the instructional material without having the distractions of a home environment. Parents' preexisting preferences for web-based training versus in-person training should be considered when providing parents with training opportunities, especially since parents' preference for a particular instructional format may influence training performance (Sitzmann et al., 2006).

Despite its advantages for increasing knowledge, it is unlikely web-based training will replace the need for individualized, in-vivo training for developing skills in implementing behavioral interventions. It may, however, be appropriate in a hybrid training model. Many in-vivo training programs in which parents are trained to learn intervention strategies include a didactic portion occurring prior to any behavioral skills training. Didactic training often occurs in a classroom/lecture format in which parents are required to schedule a training that accommodates their schedule, travel to the training site, and perhaps find childcare while they participate in training. For some parents, it may be convenient to have the option of completing the didactic portion of the training through web-based training, prior to receiving in-vivo instruction from a qualified professional.

The current study also presented two additional interrelated research questions; first, do parents of children with ASD demonstrate increases in their ability to request evidence-based treatments for their child after participating in web-based training? Moreover, are parents more empowered to request these treatments after participating in web-based training in behavioral interventions? In considering the implications of results of the current study, the limited sample is especially of note when reviewing the results. Based on mean changes, the treatment group increased their ability to identify evidence-based treatments and their ability to request these treatments. Given the positive gains experienced by the treatment group, it is worth continuing this line of research with a larger sample. However, it is important to account for the characteristics of the current sample, which may not accurately represent the general population of parents of children with ASD. Participants in the current sample represent parents who were actively seeking information regarding services for their child by participating in parent groups or web-based communities for individuals affected by ASD. In addition to voluntarily

participating in research that requires a reasonable amount of time and effort, it is possible that these parents were also seeking additional information that increased their knowledge of evidence-based treatments. Therefore, regardless of whether parents had access to the web-based training (or were assigned to the wait-list control group) they may have been exposed to additional information regarding evidence-based treatments elsewhere. There are certainly parents, not captured in the current study, who are not engaging in the same informational activities (e.g., reading web-based articles; engaging in web-based conversations with other parents and professionals) as those who participated in this study.

The findings of the current study highlight the challenge that many parents face when deciding between evidence-based treatments and those lacking scientific support. Even after participating in (and demonstrating mastery of) training in specific evidence-based procedures, many parents in the current sample continued to indicate a preference for treatments that do not have evidence of efficacy for the treatment ASD symptoms (e.g., sensory integration, facilitated communication, handwriting training). This raises an important question to service providers: how can we assist parents in requesting treatments that are grounded in scientific evidence over those based in pseudoscience in their child's IEP?

Ethical and effective clinicians hold sound empirical evidence in a high regard and strive to promote only those treatments that have been supported by science. They are urged to practice philosophic doubt in assessing the integrity of any given treatment (Cooper et al., 2007) and to share any contraindicated findings to promote public health. However, the findings of the current study suggest that parents may value other sources of information over scientific evidence. Professionals may try to assist parents in selecting evidence-based treatments over those lacking scientific support by presenting parents with scientific evidence that supports a treatment (or

discounts an unsupported treatment). However, flooding parents with scientific evidence may actually be off-putting to some parents and some may continue to select treatments that had previously (and perhaps erroneously) suggested promising outcomes. It is possible that some parents may not trust the scientific evidence that is presented to them (Casady, Cresswell, Wilson & Panter-Brick, 2006).

In a randomized clinical trial, a political scientist explored the effects of providing scientific evidence as a means of debunking myths (Nyhan, Reifler, Richey, & Freed, 2014). One long-standing myth in the field of ASD is the suggestion of the causal link between measles-mumps-rubella (MMR) vaccines and autism. Despite the large body of research that not only discredited these claims, but also reported the serious health risks associated with the choice not to vaccinate, a large population of anti-vaccination activists and supporters maintain their prominent voice among parents (Smith, Humiston, Marcus et al., 2011). The dissemination of misinformation and erroneous beliefs surrounding the MMR debate has raised concerns for physicians, psychologists, and service providers: what is the most effective way of communicating the importance of vaccine safety with parents? In the aforementioned clinical trial, parent participants were randomly assigned to one of five intervention conditions to examine the effectiveness of providing corrected information regarding MMR vaccines as a means of increasing parental intent to vaccinate their child, as well as decreasing vaccine misconceptions (Nyhan et al., 2014). Interventions consisted of 1) providing parents with accurate information regarding the lack of a causal relationship between MMR and autism (using CDC documentation), 2) providing information regarding the dangers of disease prevented by the MMR vaccine, 3) providing parents with pictures of children with diseases that could be prevented by the MMR vaccines, 4) a narrative account of a parent's experience of her infant

child's hospitalization after contracting measles, and 5) a control condition. When trying to change an individual's misconceptions by presenting accurate information, the presentation of correct information may not only be ineffective in changing the falsified beliefs, it may even make the misperceptions worse. Specifically, parents who reported least favorable attitudes towards vaccines prior to participating in the intervention demonstrated a decrease in their intent to vaccinate their child at the conclusion of the study. Among the most profound implications of the study was that service providers' best response to false beliefs may not necessarily be the provision of correct scientific information. If these results extend to the area of behavioral interventions then, at a minimum, parents who demonstrate increases in their knowledge of evidence-based treatments when participating in a web-based training program may not experience collateral gains in their intent to request these interventions.

The current study aimed to explore whether parents of children with ASD increased parental empowerment specific to advocating for appropriate services for their child. The results suggested that perhaps the level of parental empowerment may not have been an area in need of change for this sample, but treatment selection may be an area in need of specific intervention for parents of children on the spectrum. Even before participating in the web-based training program, both groups demonstrated relatively high levels of empowerment in their ability to request services for their children, as measured through the FES. The FES, however, did not look specifically at parental empowerment to advocate evidence-based treatments, but rather general educational and community-based services on behalf of their child. Given the high empowerment, as measured through the FES, at the time of the pre-test, it would have been difficult to produce a statistically significant change following participation in the web-based training program. These findings suggest that empowerment may not be the area in need of

specific intervention for participating families. Parents who actively seek to participate in research for their children (such as those included in the current sample) may already possess the skills to request services. However, this may not be true of the entire ASD parent community, and those parents who have had less exposure to information regarding evidence-based treatments may be worth targeting. Additionally, continued intervention to assist parents in identifying and requesting evidence-based treatments over those that are not supported appears to be the area of intervention focus. Existing research regarding treatment selection of parents of children with ASD, in addition to the findings of the present study, suggest to professionals just how difficult it may be for professionals to assist parents in selecting evidence-based treatments over those with little scientific support. Rather than selecting only those interventions validated in empirical evidence, parents may instead simultaneously use a variety of treatments (Goin-Kochel, Myers, & Mackintosh, 2007).

Parental selection of treatment is likely to be related to the parents' acceptability of a treatment. Acceptability refers to judgments about how palatable a given treatment to relevant non-professionals (e.g., clients, parents, and other potential consumers of treatment; Wolf, 1978). These judgments often include an overall evaluation of the appropriateness of the treatment given the presenting problem, the intrusiveness of the intervention, and whether the treatment consists of components that are satisfactory. Treatments with high acceptability from clients and consumers are more likely to be sought after, initiated, and adhered to than other treatments that are initiated based on criteria of efficacy alone (Kazdin, 1980).

Two of the strongest determinants to treatment adherence include how effective the intervention is in treating the behavior and the ease of implementation (Allen & Warzack, 2000; Call, Reavis, McCracken, Gillespie, & Scheithauer, 2015; Kazdin, 1980). Additionally, humans

are often biased to select interventions that lead to rapid outcomes; the longer one must wait, the less valuable the outcome is perceived to be (Lattal, 2010). As a result, delayed treatment outcomes may cause parents to choose less effective treatments that have only a short-term outcome (Allen & Warzack, 2000; Call et al., 2015).

Some interventions having immediate outcomes and others having delayed, or even worsening outcomes (Allen & Warzack, 2000). Parents may have the expectation of getting quick results from the provider. When immediate or marked changes in behavior do not occur following implementation of treatment recommendations, parents may be less likely to adhere to the treatment. This can be particularly problematic with the treatment of ASD. Some of the most effective interventions may not result in an immediate change in behavior. For example, Early Intensive Behavioral Intervention requires a high degree of intensity over the course of multiple years before very significant improvements are evidenced, and these results occur for less than half of the ASD population (Lovaas, 1987; Reichow, Barton, Boyd, & Hume, 2014). One way in which service providers may assist parents in selecting interventions and ensuring that the interventions are not discontinued prematurely may be by developing an intermediate change in child behavior to demonstrate progress made through the intervention. Because immediate behavior change may serve as a potent reinforcer for parents, it may be helpful for service providers to assist parents by breaking the terminal goal into smaller tasks, with the goal of achieving the more challenging goal at a later time. Even with treatments that do not require high intensity, desired outcomes may not be produced immediately. For example, some effective treatments (e.g., extinction) often produce an immediate increase in the problem behavior but have a long-term effect of problem reduction. The sudden increase in problem behavior may be

alarming to many parents and motivate them to (a) discontinue the intervention, (b) select another intervention, or (c) add another intervention.

Unfortunately, science does not always offer a speedy answer about treatment efficacy and this may also impact parental views about the best treatment for their child. The period of delay between the introduction of a treatment into the ASD community and the availability of robust scientific evidence may seem unreasonable to families directly affected by a condition. Further, parents may take a “kitchen-sink” approach” in their efforts to efficiently access the best treatment for their child. That is, they may request that multiple treatments to be implemented simultaneously, including those with or without support through empirical evidence. [Many](#) parents have reported that, in addition to subjecting their children to multiple concurrent therapies, they also constantly seeking new therapies to try to avoid the possibility of missing out of the one treatment that may help their child (Goin-Kochel, Myers, & Mackintosh, 2007). In addition, parents often look at practical factors (e.g., time, response effort, and magnitude of effectiveness) when considering interventions. Professionals who ignore these real world variables may not understand why parents do not focus primarily on treatment efficacy. Collectively, these factors may mean that even parents who are empowered to advocate for specific interventions for their child may be resistant to professional efforts to focus their attention on evidence-based-treatments.

The simultaneous implementation of several treatments may have important implications. Combining multiple treatments can result in multiple treatment interference, which could make it impossible for parents or professionals to identify the true source of behavior change when improvements or decrements are observed. Perhaps more important, the interaction effects resulting from the implementation of several treatments simultaneously may be an overall

reduction in the effectiveness of a treatment known to be efficacious for a given population. For example, for a child with ASD who engages in escape maintained self-injurious behavior, the introduction of an unsupported treatment (e.g., sensory integration) immediately after the child hits himself could actually result in an increase in self-injury and a loss of therapeutic engagement in a critical skill area. Professionals need to explain this potential negative outcome if they seek to guide parents toward evidence-based treatments.

It may be possible to better understand deficits in accurate treatment selection by examining the function of parent behavior. Parental adherence to treatment has been explained by considering antecedent and consequence variables, as well as the underlying motivation that explains parental behavior when selecting and implementing treatments (Allen & Warzack, 2000). When taking a functional behavior approach to understanding parental involvement in treatment, several behavioral contingencies have been suggested to influence a parent's ability to adhere to treatment. It is possible that many of these same environmental controlling variables may explain parents' treatment selection, in addition to treatment adherence.

When considering factors that influence parents' ability to select and adhere to treatment recommendations, it may be important to consider the parents' history of selecting treatment for their child (Allen & Warzack, 2000). Many parents have sought help from professionals in the past and these professionals have provided a variety of different recommendations, and it is possible that, the treatment outcome did not meet the expectations parents had for selecting the treatment. Practitioners may need to better inform parents about what can be expected following the implementation of such an intervention or a help select a different intervention that better matches the family's needs.

In discussing treatment options with parents, the language used by providers is likely to influence treatment adherence as well as the likelihood that the parents will perceive a given treatment as acceptable (Allen & Warzack, 2000). Although professionals may be inclined to use technical jargon, referencing empirical research when discussing interventions, or graphically representing behavior change, this information may be more off-putting than enticing to individuals outside of the professional ABA community (Lutzker & Whitaker, 2005). Clinicians must monitor their language usage when describing interventions and be careful to include language that is valued by parents in their consideration of treatment. It may be that some clinicians who emphasize evidence-based treatments are doing a poor job of “selling” their high quality product, and one possible solution may be to “repackage” technical language so that it is more consistent with the language of contemporary culture. There is some evidence that when behavioral terminology is presented in nontechnical terms, the treatment may be viewed as more acceptable (Witt, Moe, Gutkin & Andrews, 1984; Woolfolk & Wolkfolk, 1979). Therefore, language used by clinicians may need to describe evidence-based treatments using terminology that is consistent with highly valued cultural constructs, such as independence, freedom, self-confidence, and individual responsibility (Allen & Warzak, 2000). People touting unestablished treatments that lack adequate scientific support may have successfully recruited parents to “buy into” their product because they are using language and making promises that are highly valued by parents. It is possible that the use of improved approaches to “marketing” well-established interventions, that includes both language that is valued by parents and accurately describes the empirical support for the treatment, may result in improved skill in treatment selection, acceptability, and adherence. It is important for service providers to be aware of parents goals and values, and these goals and values be integrated into the selected treatment.

Limitations

The current study provided useful information regarding the utility of web-based programs to provide training to parents of children with ASD. However, the methodology and findings are not without limitations. Challenges with recruitment and enrollment served as one possible barrier to exploring the maximum potential of web-based training for parents of children with ASD. At the outset of the study, recruitment was limited to online-recruitment of parents living in midwestern states. Parents living in midwestern states were initially selected as the target population due to the challenges faced by families living in this region in accessing training from qualified professionals. Recruitment initially occurred by contacting a randomly selected group of parent organizations in midwestern states and requesting that recruitment flyers be disseminated to group members. Listed contacts from parent organization websites were contacted by the researchers; up to two follow up emails were sent to groups that did not respond following the initial email. Low rates of enrollment over the course of several months (i.e., one enrolled participant over the course of six months, following contact with approximately 365 parent groups) warranted an expansion of recruitment to parents living outside of midwestern states. The overall low response rate suggests that the method of recruitment for the current study may not result in a strong interest from parents. Alternatively, there may have been some aspect of the study, as described on the recruitment flyer, which may have not have appealed to parents. Perhaps only a small percentage of parents are attracted to web-based training.

Another barrier to recruitment was related to inclusion criteria that required that the child of the parent participant be between the ages of six and twelve years. This age group was identified as school-aged children, with parents who were likely to be already involved in the educational planning process for their child. This decision was made to ensure measurement of

parental empowerment would be restricted to parents who are likely to encounter similar experiences with schools. However, some parents who expressed interest in participating had children younger than the age of six years. It is possible that parents of very young children (i.e., younger than age 5) who may have just recently received a diagnosis of ASD would have benefited from participation in the current study. The results are limited to parents of older students, even though parents of younger students are those least likely to have had previous knowledge of treatments as well as experience requesting specific treatments for their child.

It was difficult to recruit parents of school-aged children who had minimal past experience participating in training in applied behavior analysis. Because participants recruited for the current study included parents who were already participating in activities that may increase their knowledge of current practices in the treatment of ASD (e.g., online communities and conversations), it is possible that parents who are most in need of assistance in identifying and requesting evidence-based treatments were not reached through recruitment for the current study. The current results may not reflect the parent population that feels least empowered and have the smallest knowledge base regarding efficacious treatments.

In addition to challenges to recruitment, enrollment procedures also resulted in delays and barriers to participation. During a pre-enrollment phone call in which potential participants were screened for eligibility, it was determined that many interested participants did not have records of their child's IQ scores. This may be consistent with the broadening of diagnostic criteria, as well as the increasing number of professionals responsible for diagnosing a child with ASD without having specialized training to do so (Wing, Gould, & Gillberg, 2011). Previous diagnostic criteria of pervasive developmental disorders (i.e., DSM-IV) specified subtyping for current autism spectrum disorders based on level of cognitive functioning (i.e., no significant

impairment in cognitive functioning in individuals with Asperger's disorder). Because level of cognitive functioning is not included as diagnostic criteria for the broad diagnosis of ASD in the DSM-V, not all children diagnosed with ASD have participated in a comprehensive psychological evaluation, including an assessment of intellectual functioning. As a result, many interested parents did not initially qualify for the study. The requirement to submit records of IQ was eventually removed to make training more accessible to parents whose child had not participated in a comprehensive psychological evaluation, including an assessment of intellectual functioning. This not only was a problem for recruitment, but also a limitation in determining the generalizability of the sample. Parents of children with ASD with varying levels of cognitive functioning are likely to experience differences in symptom severity, behavioral symptoms, and skill deficits (Joseph, Tager-Flusberg, Lord, 2002). Because the child's IQ score was not obtained for all participants, it was not possible to gauge the mean level of functioning of the children whose parents participated in the study. In fact, one participant reported that not all of the modules were relevant to the treatment of her high-functioning child with ASD. It would be useful to know additional child characteristics that suggest specific training needs for parents.

Another challenge to enrollment procedures included the submission of appropriate documentation in a timely manner. To ensure security of HIPAA-protected information, participants were sent paper consent forms and were asked to submit appropriate documentation by mail (i.e., medical documentation of confirmed diagnosis). This resulted in additional delays to timely enrollment. There were several instances in which eligible participants indicated interest in the study by contacting the researchers after receiving an electronic recruitment flyer and participating in the phone screening. There were parents who participated in the phone screening and were sent the study documents by mail. However, some parents did not return the

materials, even after follow-up contact from the researchers. This may suggest that parents became less interested or motivated to complete the training when the response effort (i.e., tracking down medical records and filling out consent forms) was greater than the perceived benefits. Difficulties in obtaining the necessary documentation and delaying access to participation were perhaps suggestive of just how difficult it is for parents of children on the autism spectrum to devote the time to these types of clerical tasks. If parents did not sustain interest in the project as a result of this demand on their time, the generalizability of the results are somewhat compromised.

The extended period of time for screening, enrolling, and then actually completing the training is relevant to considering the rate of attrition in the current study. There were two parents in the study who formally withdrew from the study, one reporting a lack of relevance of the training content to her child, and the other reporting to not have the time. There were other participants who enrolled in the study who completed the enrollment process and even started the training. However, over time, they stopped completing the training according to the schedule. When contacted by the researchers to ask whether they would like to continue to with the training or to formally withdraw, oftentimes, these participants did not response.

The aforementioned challenges to recruitment and enrollment resulted, overall, in a small sample size. Although significant within groups effects were observed between pre- and post-assessments (i.e., ATS knowledge, knowledge of evidence-based treatments), the observed power for several between groups analyses (e.g., empowerment, and ability to identify and request evidence-based treatments) was extremely low (e.g., < 0.10). Still, gains demonstrated by the treatment group on the FES, albeit not statistically significant, were negligible (i.e., change in raw score of 1.57), so it is unlikely that an increase in sample size would result in a significant

between group effect for empowerment. The between group effect for ATS knowledge did yield a strong effect, suggesting that the ATS training is so robust knowledge gains could be detected despite the small sample size.

Additionally, the current sample of participants was somewhat homogenous and may not be a geographically and economically representative sample. Specifically, participants in the current study included families with in-home access to computers and Internet. The lack of geographical, economical, and racial representation has been a pervasive limitation of research conducted on parents of children with ASD, with most research being conducted on Caucasian mothers, of middle to high socioeconomic status (Ogston, Mackintosh, & Myers, 2011; Myers, Mackintosh, & Goin-Kochel, 2009). Because the prevalence of ASD is similar across races and socioeconomic groups (CDC, 2014), there is a significant need for research with larger sample sizes that are more representative of the population. However, the challenges to recruitment and enrollment experienced in the current study was indicative of how difficult it may be for families of children with ASD (those who self-initiated interest in opportunities for training and had in-home access to a computer with internet) to find the time and resources to complete a web-based training program in a timely manner. Although the current study aimed to explore more accessible methods of providing parents with training opportunities, families without the same level of resources as those in the current sample may experience additional difficulties in completing training using the web-based training format.

Once parents were enrolled in the study, there were additional methodological limitations. Specifically, although the ATS training material were deemed appropriate for the current study based its training components that are consistent with the adult learning literature (e.g., breaking information into smaller chunks, the use of video examples, and frequent

assessment and feedback), it is important to acknowledge that ATS training was developed for use with both professionals and parents. The training materials have historically been used to increase knowledge and skill of principles regarding ABA, and had not specifically been used to target or measure empowerment or parental ability to identify evidence-based treatments over those with little research support. It is possible that supplemental instructional materials may need to be developed if researchers seek to specifically target empowerment and the ability to select evidence-based treatments as areas of change. Furthermore, the ATS training is expansive and completion of the entire series of training modules is not common. Participants in this study completed only a small portion of the ATS training curriculum, which may have left some gaps in their training. The modules included in the current study were selected based on the foundational principles of ABA—the researchers aimed to provide parents with a reasonable amount of training materials that would not burden their already busy schedules. The modules included basic principles of ABA, but did not cover the range of behavior and skills to which these principles could be applied. It is possible that the amount of training that was available to the treatment group was not sufficient to increase parental empowerment or the selection of evidence-based treatments.

Additional methodological limitations of the current study included the measures that were selected to measure the effect of the intervention. First, the measure used to assess parental ability to identify and request evidence-based treatments had no known psychometric properties. Participants were provided with a list of evidence-based treatments and unsupported treatments and were asked to select items that were evidence-based or that they would select to request for the child. Although this list was developed based on the literature on evidence-based treatments, there was no way of assessing if this was a valid method of measuring these behaviors. An

assessment tool that has established construct validity may provide additional information regarding parents' true ability to identify and request evidence-based treatments.

Another limitation with regard to measurements used in the current study included the quality of the FES, the tool used to measure parental empowerment. This was the only published assessment tool to measure empowerment for parents of children with emotional disabilities. The FES was not developed to be a tool for specifically measuring parents' empowerment to advocate evidence-based treatments, but rather their general attitudes and knowledge about their ability to advocate on behalf of their child within day-to-day life, professional systems (e.g., school systems), and community/political systems (Koren, 1992). This measure has not been assessed for use with parents of children with ASD. Further, the current study only utilized the service system subscale to assess empowerment for educational planning. Although this met the goals of the current study, the lack of psychometric data for the use of the service subscale with parents of children with ASD is a limitation. It should also be noted that this measure is quite dated (i.e., 1992) and no updated version of the measure or psychometric data were published. Because it is likely that social and political influences over the past 20 years have changed services that are accessible to children with disabilities, there may be an additional limitation in determining the construct validity of the FES as a means of assessing parental empowerment in the current study.

Suggestions for Future Research

The present study provides valuable information regarding web-based training for parents of children with ASD, empowerment to advocate in educational planning for their child, and parental skill in identifying evidence-based treatments versus those lacking empirical evidence.

However, the limitations of the current study suggest directions for future research to add the bodies of literature in these areas.

The primary limitations of the current study are regarding the sample. Future research should replicate this study with a larger sample of parents of school-aged children with ASD. As this study included parents of children ages six to twelve years, future research should replicate this study with younger aged children, perhaps those who are just entering the public school system. It is possible that empowerment may be different for parents who have a history of interaction with the school system, compared to parents who have not yet initiated the special education planning process for their child. Therefore, differences in parental empowerment should be considered in relation to experience with the school system. Future research would likely benefit from having parents of children who have just recently received a diagnosis of ASD and are just beginning to navigate the educational planning process. If, after receiving a diagnosis, a family is immediately provided with the appropriate resources for their child to access evidence-based treatments, there may be less of a need for parents to search for treatments on their own, which may potentially lead them down a rabbit hole of unsupported treatments.

The difficulty that was observed in parent skill in requesting evidence-based treatments over those with little scientific support after participating in training in evidence-based strategies was among the most informative findings of this study. These findings suggested that web-based training in basic behavioral strategies is not, alone, sufficient in assisting parents in selecting primarily evidence-based treatments for their child and many parents are still inclined to select treatments that are only reported to be effective based on personal accounts and anecdotal evidence. However, the development of live or web-based training curriculum that are specifically designed to help parents make decisions regarding treatments for their child may

produce different outcomes. A family friendly method for selecting treatments would be helpful for both parents and the professionals who attempt to guide them in their decision-making.

Despite the lack of change in parents' ability to request evidence-based treatments during the current study, parents who participated in web-based training did significantly increase their knowledge of behavioral strategies. It would be beneficial to explore additional ways in which technology could be used to train parents of children with ASD. For example, although the current study did not explore participant skill in implementing these behavioral strategies, it is possible that additional support provided through web-based consultation or telemedicine from a trained professional could examine the application of knowledge obtained through web-based training.

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Appendix A

Research Participant Recruitment Flyer/ Consent Forms

Parent Training Opportunity



Web-Based Training in Behavioral Interventions: Examining Knowledge and Empowerment in Parents of Children with ASD

For this project, we are interested in identifying ways to equip parents to request evidence-based treatments in their child's school.

Parents in this study will complete a series of online surveys regarding their ability to request evidence-based training in their child's school. Then, they will participate in a web-based training program.

This study requires 8 hours of training to be completed across a 6-week period.

Parents who meet the following criteria may be eligible:

- Your child or legal dependent is between 6 and 12 years old.
- Your child has a diagnosis of autism, Asperger's Disorder or PDD-NOS and you can provide medical documentation.
- You have access to a computer to participate in web-based training.
- You have NOT completed 7+ hours of training in ABA in the past 3 years.
- Your child attends a traditional general- or special-education school and is not receiving full-time therapy at an ABA clinic (instead of attending school).

If you are interested and qualify, please contact sconnolly@bsu.edu

This study has been approved by the Ball State University Institutional

Parental/Legal Guardian Consent Form

Study Title Web-based training in behavioral interventions: Examining knowledge and empowerment in parents of children with Autism Spectrum Disorder.

Study Purpose and Rationale

The purpose of the study is to:

- Determine if online training is useful in increasing your knowledge of evidence-based treatments.
- Determine whether training in behavioral interventions will help you request these treatments during your child's educational planning (i.e., IEP meetings).
- Assess your knowledge of behavioral interventions.
- Assess your level of empowerment in educational planning.
- Assess your ability to request empirically-supported treatments for your child.
- Assess your satisfaction with web-based training based on your participation in the study.

Inclusion Criteria

1. Parents/Legal Guardians must have a child between the ages of 6 and 12 years with a diagnosis of Autism Spectrum Disorder (diagnoses of autism, Asperger's Syndrome or pervasive developmental disorder – not otherwise specified are also acceptable). This diagnosis must be documented through medical records. You must be willing to complete all procedures described below.
2. This study also requires that you have in-home access to a computer and Internet access.

Exclusion Criteria

1. Parents who have previously received more than 7 hours of training in applied behavior analysis (ABA) within the past 3 years will be ineligible for participation.
2. Parents who score above 70% during the first pre-test of knowledge of behavioral interventions.
3. Parents who have previously completed ATS web-based training will also be excluded from the study.
4. Parents/legal guardians of children who have additional medical/psychological diagnoses that are not considered to be commonly occurring in individuals with ASD will be ineligible for participation.
5. Parents of children who are homeschooled or attend an ABA clinic instead of participating in a traditional general- or special education school will be excluded from the study.

Participation Procedures and Duration

For this project you will be asked to:

1. Submit medical records confirming your child's diagnosis of Autism Spectrum Disorder (or Autistic Disorder, Asperger's Syndrome, or Pervasive Developmental Disorder-Not Otherwise Specified).
2. Participate in a phone conference with the researcher to discuss procedures for this study. Future communications will occur through e-mail or by phone when necessary.
3. Be assigned to one of two groups: 1) Training group or 2) Waitlist-control group.
 - a. If assigned to the training group, you will complete the training within the scheduled 5-week period.
 - b. If you are assigned to the wait-list control group, you will be expected to complete the pre-test during the first half of the 5 week training period, and the post-test during the second half of 5-week training period. Participants assigned to the wait-list control group will not have access to the training program until after the 5-week training period is complete.
4. Complete several pre-training web-based surveys, including a(n):
 - a. Demographic questionnaire (background information)
 - b. Assessment of parental empowerment
 - c. Assessment of your knowledge of empirically-support treatments
5. Complete a maximum of 8 hours of Autism Training Solutions (ATS) web-based training on treatments that have been shown to be effective for children with ASD. The web-based training program consists of four training sessions (8 hours, maximum), which will be completed across a 5-week period.
6. For each training module, you will be provided with instruction (through audio-visual presentations) on strategies of applied behavior analysis including, the use of reinforcement, gaining instructional control, teaching verbal behavior. For each module, you will need to complete pre-tests and post-tests through the web-based program (ATS).
7. At the conclusion of the training, you will need to complete two web-based questionnaires, including a(n):
 - a. Measure of parental empowerment
 - b. Assessment of your knowledge of empirically-support treatments
 - c. Assessment of satisfaction survey through ATS.

Data Confidentiality or Anonymity

Test and survey data will be secured through Autism Training Solutions. Any additional documents containing identifying and confidential information will be mailed through USPS and then scanned, password-protected, and uploaded to a secure Ball State server. Once the forms have been uploaded, the original paper versions will be destroyed and only electronic copies will be accessible by members of the research team.

Storage of Data

Testing and survey will be stored as described above. Coded data will be entered into a secure server and also stored on the researcher's password-protected computer for five years and then deleted. Only members of the research team will have access to the data.

Risks or Discomforts

It is possible that parents who participate in training in behavioral interventions may alter their methods of interacting with their child by using applied behavior analytic techniques. Although these techniques have demonstrated effectiveness in improving the behaviors of individuals with ASD, parents and their children may initially feel uncomfortable as the parent alters his/her strategy for interacting with the child. However, the behavioral strategies included in the training package are generally non-restrictive, safe for both the parent and child, and have been successfully implemented by parents.

Who to Contact Should You Experience Any Negative Effects from Participating in this Study

Should you or your child experience any negative effects from participating in this study, you may contact Dr. Eric Pierson. He can be reached at eepierson@bsu.edu or 765-285-8506.

Benefits

There is evidence that web-based training can increase parental/legal guardian knowledge about effective autism treatments. Although our goal is to give provide you new knowledge and feedback that may help you in your interactions with your child, we cannot guarantee this will occur.

Voluntary Participation

Your participation in this study is completely voluntary and you are free to withdraw your participation at anytime for any reason without penalty or prejudice from the investigator. Please feel free to ask any questions of the investigator before signing this form and at any time during the study. If you would like to withdraw from the study at any time, please contact the investigators using the contact information listed below.

Should you choose to withdraw from the study, you will be contacted by Dr. Susan Wilczynski (faculty supervisor) to schedule a voluntary follow-up phone call to discuss the reasons for your withdrawal. The purpose of this phone call will be to find out ways to make the study more convenient for future participants. You are under no obligation to participate in this conversation.

IRB Contact Information

For questions about your rights as a research subject, please contact the Director, Office of Research Integrity, Ball State University, Muncie, IN 47306, (765) 285-5070 or at irb@bsu.edu.

Who to Contact If I am Interested in Participating in this Project

Contact Sarah Connolly, the principal investigator, if you are interested in participating in this process. She will arrange a phone conference to discuss each part of the study with you. Contact information is listed below.

Consent

I, _____, agree to participate in this research project entitled, “Web-based training in behavioral interventions: Examining knowledge and empowerment in parents of children with Autism Spectrum Disorder.” I have had the study explained to me and my questions have been answered to my satisfaction. I have read the description of this project and give consent to participate. I understand that I will receive a copy of this informed consent form to keep for future reference.

To the best of my knowledge, I meet the inclusion/exclusion criteria for participation (described on the previous page) in this study.

Parent’s/Legal Guardian’s name (please print)

Parent’s/Legal Guardian’s Signature

Researcher Contact Information**Principal Investigator:**

Sarah Connolly, M.A.
Doctoral Student, School Psychology
Department of Educational Psychology
Ball State University
Muncie, IN 47306
Email: sconnolly@bsu.edu

Faculty Supervisor:

Susan Wilczynski, PhD, BCBA-D
Department of Special Education
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Telephone: (765-285-5706)
Email: smwilczynski@bsu.edu

Appendix B

Dependent Measures

Family Empowerment Scale: Service System Subscale (Koren, DeChillo, & Friesen, 1992)

1. I feel that I have a right to approve all services my child receives.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
2. I know the steps to take when I am concerned my child is receiving poor services.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
3. I make sure that professionals understand my opinions about what services my child needs.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
4. I am able to make good decisions about what services my child needs.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
5. I am able to work with agencies and professionals to decide what services my child need.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often

6. I make sure I stay in regular contact with professionals who are providing services to my child.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
7. My opinion is just as important as professionals' opinions in deciding what services my child needs.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
8. I tell professionals what I think about services being provided for my child and family.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
9. I have a good understanding of the service system that my child is involved in.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often
10. Professionals should ask me what services I want for my child.
 - a. Never
 - b. Seldom
 - c. Sometimes
 - d. Often
 - e. Very Often

Knowledge of Evidence-Based Treatment (Pre-/Post-test)

1. Which of the following are evidence-based treatment for individuals with ASD? (select 6)
 - ☐ Facilitated Communication
 - ☐ Auditory Integration
 - ☐ Functional Communication Training
 - ☐ Sensory Integration: Brushing
 - ☐ Sensory Integration: Weighted Vest
 - ☐ Shaping
 - ☐ Token Economy
 - ☐ Personal Instruction
 - ☐ Modeling
 - ☐ Resolving anaphora
 - ☐ Naturalistic Teaching/Incidental Teaching
 - ☐ Gluten- and casein-free diet
 - ☐ Completing close sentences
 - ☐ Sentence combining
 - ☐ Behavioral momentum
 - ☐ Discrete Trial Training
 - ☐ Differential Reinforcement
 - ☐ Prompting and Fading
 - ☐ Speech output and orthographic feedback
 - ☐ Errorless learning
 - ☐ Noncontingent reinforcement
 - ☐ Handwriting training

2. (*Pre-test only*) Which of the following treatments have you previously requested during your child's IEP meetings (select all that apply)
 - ☐ Facilitated Communication
 - ☐ Auditory Integration
 - ☐ Functional Communication Training
 - ☐ Sensory Integration: Brushing
 - ☐ Sensory Integration: Weighted Vest
 - ☐ Shaping
 - ☐ Token Economy
 - ☐ Personal Instruction
 - ☐ Modeling
 - ☐ Resolving anaphora
 - ☐ Naturalistic Teaching/Incidental Teaching
 - ☐ Gluten- and casein-free diet
 - ☐ Completing close sentences
 - ☐ Sentence combining
 - ☐ Behavioral momentum
 - ☐ Discrete Trial Training
 - ☐ Differential Reinforcement
 - ☐ Prompting and Fading

- ☐ Speech output and orthographic feedback
 - ☐ Errorless learning
 - ☐ Noncontingent reinforcement
 - ☐ Handwriting training
3. (*Post-test only*) Which of the following treatments would you like to request in your child's next IEP meeting? (select all that apply)
- ☐ Facilitated Communication
 - ☐ Auditory Integration
 - ☐ Functional Communication Training
 - ☐ Sensory Integration: Brushing
 - ☐ Sensory Integration: Weighted Vest
 - ☐ Shaping
 - ☐ Token Economy
 - ☐ Personal Instruction
 - ☐ Modeling
 - ☐ Resolving anaphora
 - ☐ Naturalistic Teaching/Incidental Teaching
 - ☐ Gluten- and casein-free diet
 - ☐ Completing close sentences
 - ☐ Sentence combining
 - ☐ Behavioral momentum
 - ☐ Discrete Trial Training
 - ☐ Differential Reinforcement
 - ☐ Prompting and Fading
 - ☐ Speech output and orthographic feedback
 - ☐ Errorless learning
 - ☐ Noncontingent reinforcement
 - ☐ Handwriting training

ATS Satisfaction Survey (Post-test only)

1. How effective was the ATS training in helping you understand the concepts it presented?
 - Extremely effective
 - Effective
 - Somewhat effective
 - Not effective
2. Using a self-rating scale of 1-5 (being the highest ability level) what rating would you give yourself in your ability to apply and correctly implement the knowledge you gained in this coursework?
 - 5 = Expert
 - 4 = Advanced
 - 3 = Average
 - 2 = Below Average
 - 1 = Did not comprehend material.
3. What was the average amount of time you spent per session when accessing the ATS eTraining platform?
 - 0-30 minutes
 - 45-60 minutes
 - 75-90 minutes
 - 120 minutes or longer
4. To what degree were you able to apply the information in the training video to your daily life.
 - None
 - A little
 - I used some of the concepts right away
 - I was able to apply many of the concepts right away
5. Would you recommend other parents/caregivers of children with ASD to participate in ATS online training?
 - Yes
 - No
6. I am comfortable and have experience using technology
 - Not at all
 - A little
 - Yes
 - I am very comfortable
7. Do you prefer web-based training over in-person training?
 - I strongly prefer web-based training

- I have a slight preference for web-based training
 - I have a slight preference for in-person training
 - I strongly prefer in-person training
8. Do you have any additional comments regarding your experience with ATS?
- (open ended response box)

Appendix C

IRB Approval

IRBNet Board Action – Connolly, Sarah

1/22/14 2:17 PM

IRBNet Board Action

Jennifer Weaver <no-reply@irbnet.org>

Tue 1/21/2014 3:39 PM

To: Connolly, Sarah <scconnolly@bsu.edu>; Wilczynski, Susan Marie <smwilczynski@bsu.edu>;

Please note that Ball State University IRB has taken the following action on IRBNet:

Project Title: [499377-1] Web-Based Training in Behavioral Interventions: Examining Knowledge and Empowerment in Parents of Children with Autism Spectrum Disorder
Principal Investigator: Sarah Connolly, M.A.

Submission Type: New Project
Date Submitted: January 8, 2014

Action: APPROVED
Effective Date: January 21, 2014
Review Type: Expedited Review

Should you have any questions you may contact Jennifer Weaver at jmweaver@bsu.edu.

Thank you,
The IRBNet Support Team

www.irbnet.org

IRBNet ID: 499377-7
USER PROFILE LOGOUT

Welcome to IRBNet
Sarah Connolly

My Projects

Create New Project

♥ My Reminders (197)

Project Administration

Project Overview

Designer

Share this Project

Sign this Package

Submit this Package

Delete this Package

Send Project Mail

Reviews

Project History

📧 Messages & Alerts (54)

Other Tools

Forms and Templates

Review Details

[499377-7] Web-Based Training in Behavioral Interventions: Examining Knowledge and Empowerment in Parents
Ball State University IRB, Muncie, IN

Submission Details

Submitted To	Ball State University IRB, Muncie, IN
Submitted by	Sarah Connolly
Submission Date	12/23/2014
Submission Type	Continuing Review/Progress Report
Local Board Reference Number	

Review Details:

Agenda	Review Type	Board Action	Effective Date	Project Status	Expiration Date
01/14/2015 11:00 AM	Expedited Review	Approved	01/14/2015	Active	01/13/2017

Board Documents:

Document Type	Description	Last Modified	View
Expedited Approval Letter	Expedited Approval Letter	01/15/2015 02:55 PM	